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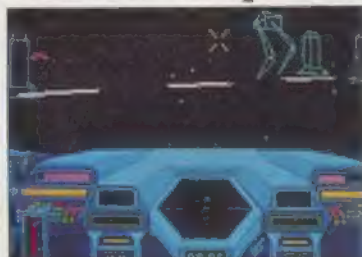
POPULAR Computing WEEKLY

11-17 September 1986

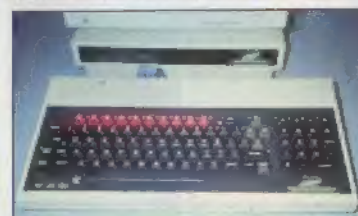
Vol 5 No 37

PCW show heralds bumper autumn

All the show news starts on p24



Above: Amstrad's PC1512. Top right: Rainbird's *Star Glider*. Right: Spectrum Plus 2. Bottom left: Acorn's Master Compact micro. Left: Ariolasoft's *Marble Madness*, Commodore 64 version.



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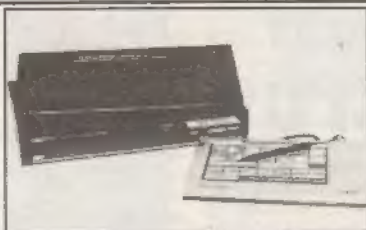
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Expanding the Amstrad DMP-2000 printer buffer. Dave Race shows you how.



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The latest hardware, the forthcoming software and all the games fit to print. Over nine pages on the home micro industry's showcase exhibition, starting on page 24.



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Atari's new supermicros

ATARI is heading into the Christmas market with two new machines at the top of its range, but although the company is now to offer a £344 unbundled version of the 520ST as a form of flexible response to the Amstrad PCs, it won't be headed for direct competition with Alan Sugar – yet.

The two new machines are the 2080STS and the 4160STS – 2Mb and 4Mb versions of the 68000-based machine. They're due to go on the market in November, and retail prices will be £1,352 and £1,716 respectively for versions with mono monitor, and £1,687 and £1,952 for colour.

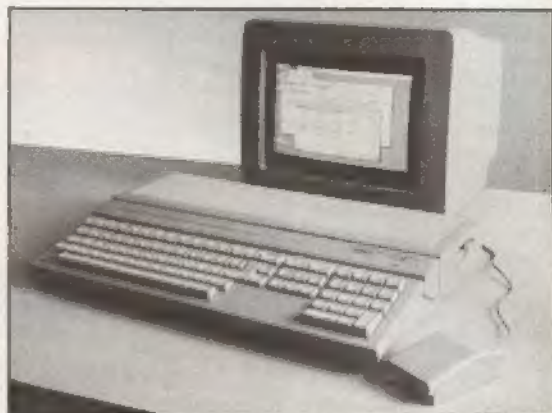
According to Atari general manager Max Bambridge the machines aren't intended for the mass market, but are intended to provide massive Ram for specialist areas such as the audio and video industries.

The price cut on the 520ST means that Atari's "£100 off" summer offer is now permanent, and that a mono ST system can be put together for around £550 retail. This doesn't rival Amstrad's entry level of £444 for a PC, but Atari is at pains to point

out that the ST is a more sophisticated machine, and company president Sam Tramiel is currently planning assaults on Amstrad in terms of power, price and design.

It's not clear what form these assaults will take, but Tramiel clearly would like to do all three at once. A mock-up of a new machine, which Tramiel sees as selling in tandem with the current range and Bambridge says will launch at the Hanover Fair next year, was being shown discreetly in Atari's back room at the PCW show. The keyboard is similar to that of the present range of STs but is minus the section holding the various processors and Ram chips. The new design houses these in a compact box, the show prototype being equipped with a single 3½ inch drive. Expansion such as hard discs and extra floppy drive are housed in a similar case.

Atari president Sam Tramiel says he hasn't decided on the amount of Ram production machines will have, but initially it will be either 2Mb or 4Mb. Versions of the machine will also house the full 68020 processor. The price also hasn't been fixed.



More power to your ST

He describes this first as "competitive", but follows it up by making it clear the competitor will be Amstrad, and specifically the new Amstrad PC.

Tramiel envisages it selling as a PC-style bundle, and ultimately it appears that Atari will be looking at a range of 68000-based bundles starting at mono monitor, ST and single drive for around the £450 mark. A 512K version would be a credible challenger, but one, two or even 4Mb machines would be more in keeping with Atari's sledgehammer approach to marketing. The company is however likely to hang back to see how the Amstrad PCs sell, and to concentrate on getting the ST range more widely accepted.

Tramiel freely admits that Atari still has a tough task

ahead of it in establishing the ST, particularly now that the IBM standard is dominant in the US home market and poised for take-off in Europe's equivalent. The company's target is 25 per cent of the market, and although he claims to be close in Europe, Atari hasn't achieved anything like that in the US or the UK.

But as far as he's concerned the PC craze in general and Amstrad in particular, can't last. "The PC is seven or eight-year-old technology. It's technically limited, and we'll be mounting campaigns to compare the ST to the clones. This year the clones will have a big market share, but as software becomes available the 16-bits will begin to take over. In five years the 68000 and 68020 will be taking over the marketplace."

Software costs fall

NEW STAR Software is planning a price blitz on the PC software market, and predicts that it will force the cost of applications down below £100. Most of the traditional PC software suppliers have set their faces against price cuts but, says New Star spokesman Chris Laing, "They will find they will have to change their minds if they want to stay in the game."

Initially the major software houses will be unwilling to enter into cheap licensing deals, reasoning that this will destroy the full price software market, so New Star intends to supply the hardware clone market by producing soft-

ware clones. The company will initially be selling MSDOS versions of *New Word 2* (£69), a *Wordstar* compatible word processor; *VP Planner*, Paperback Software's *Lotus 1-2-3* clone (£99); *VP-Info*, a *dBase III* workalike (£99), and *Cracker 3*, a £69 memory resident spreadsheet.

These are to be followed up with *Streaker*, which for £99 allows *New Word* and *Wordstar* text files to be indexed to form databases. Further products are to follow, but it's unlikely that many of these will be licensed versions of the existing industry standards.

Laing accepts that some

users will want the real thing rather than lookalikes, but feels that the new users the Amstrad PC will bring in won't be bothered about the name of the product. This will mean the bigger companies will either have to cut prices or retreat into the higher cost corporate sector of the market.

Chess change

Popular Computing Weekly, volume 5 issue 34 the pictures of *Psi Chess*, and *Colossus 4* were inadvertently transposed.

Profuse apologies to both software houses.

Laskys offers support for new users

HIGH street retailer Laskys is to sell a hotline support service for new computer users for £39.99 for a three-month subscription. The package is being operated by the Interlex software group, and operates six days a week, 9am-9pm weekdays and 9am-1pm on Saturday.

The service is likely to be particularly attractive for purchasers of cheaper computers that don't come with a great deal of support.

Details from Laskys, Hardman House, The Hyde, Hendon, London NW9 6JJ. Tel: 01-200 0444.

Queues form for the PCs

BACKLOGS were building up for Amstrad PC orders within hours of the machine's launch last week. By Friday Dixons, which had rushed display models to its stores, was quoting delivery in six to eight weeks for floppy versions of the machine, but couldn't give a date at all for the hard disc models.

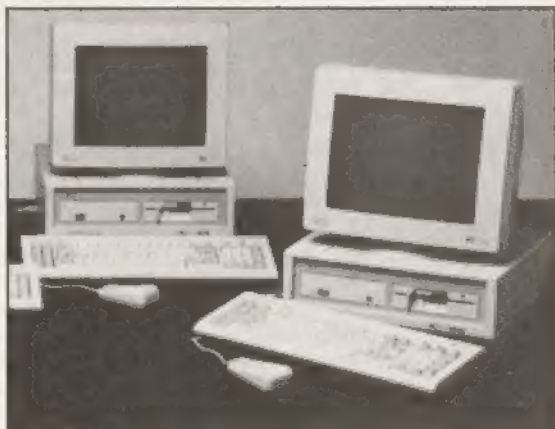
The company's Holborn branch, which houses one of Dixon's biggest computer sections, has only one PC on display. "I can't even quote a delivery date for the hard disc machine," said a spokesman. He said he was getting estimates of anything between two to eight weeks for the floppy versions, but as demand seemed to be similar to that for the PCW when it was first launched he felt six weeks was more realistic.

Amstrad intends to ramp up production of the ma-

chines to 70,000 a month by Christmas, and the growing waiting list for the floppy versions of the machines can be ascribed to demand, but the longer, as yet undetermined delay for the hard disc machines seems more supply-related.

One industry source suggested that the delay was related to the fact that the decision to launch the 10Mb and 20Mb versions of the PC was taken very late, just prior to the launch. Because the machine's construction has been standardised it's fairly easy for Amstrad to plug hard discs rather than floppy drives into the machines coming off the line, but if the decision was taken this late there's likely to be some delay while adequate hard disc stocks are secured.

The low price of the top end machines (£822 for



Wait for it?

10Mb and mono monitor) is also likely to stimulate demand for hard disc versions, and Amstrad will inevitably have problems in judging proportions correctly.

An Amstrad spokesman confirmed that there has been heavy demand for the PCs already, and although he wouldn't state categorically that the floppy and hard disc machines would reach the shops at the same time he denied that the launch of the

hard disc machines had been in any way a last-minute decision.

"Amstrad products are launched when they're on the water," he said, and as all eight versions of the PC have undoubtedly now been launched freighters full of hard disc PCs must at this very moment be cruising towards us. If this is the case then deliveries to end users should be well under way by October.

Hotlines

Argus Press Software, although avoiding the hustle and bustle of the main PCW show had two excellent new games on display at their "trade only" suite at the nearby Royal Kensington Hotel. First of all, *Glider Rider* on Spectrum, the latest from the Quicksilver label. Features a novel scenario - blowing up nuclear reactors on a plastic island - and well executed 3D

graphics. It has you alternately chugging around the Abraxas Corporation HQ on a motorcycle, and flying round it under a handglider.

The most impressive feature of the game is the sound - only implemented on the 128/Plus 2 versions - which can only be described as stunning. It includes some excellent samples, and must be the best yet for any Spectrum game to date. What will happen when programmers really start getting to work on the

Plus 2 is anyone's guess - keep your ears peeled.

It's priced at £8.95, out on Spectrum, Amstrad and Commodore soon.

Second up was an excellent title from **Lothlorien** which could open up computer wargames to a whole new range of computer users. Called *Legions of Death*, the game deals with the Punic Wars between Carthage and Rome. Gone are the artificial constraints of hex grids and in their place is a unique "cartographic" representation of the playing area. The whole playing area is presented on the left hand side of the screen.

You build up and move your armies and fleets under full icon control with one/two player options. A novel mix of tactical and strategic elements, it's well worth a look. Out at £9.95 on Spectrum, Amstrad and Commodore soon.

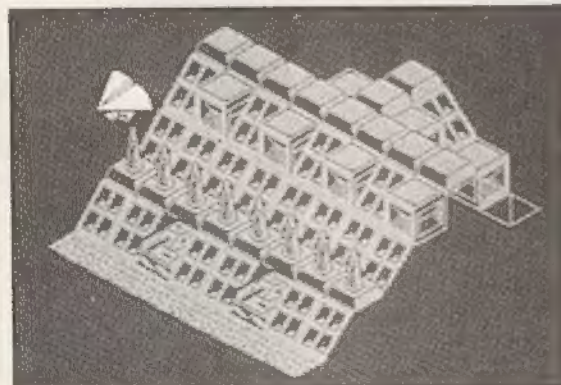
Gremlin Graphics has lined up its autumn collection. Launching somewhat sooner (September 22), *Footballer of the Year* is a novel idea in that instead of managing a whole

football team you adopt the role of a single player. You start at the bottom at the age of 17 with aspirations to reach the top.

Features will include transfers, career record cards, League, UEFA, FA and Milk Cup games... and who knows, probably cartilage operation and *News of the World* scandals as well. Out on all major systems, priced at £6.95 (C16/Plus 4), £7.95 (Spectrum, MSX) and £9.95 (Amstrad, CBM 64, BBC/Electron).

Palace has brought in comic artist Dan Malone for the design of its latest arcade adventure - *Antirad*. It's based in a post holocaust world which has been taken over by aliens, and you play the champion of the enslaved humans and must explore the hazard filled caverns of the ancient volcano in which they have taken residence.

The ultimate aim is to assemble a complete suit of armour (actually a sophisticated combat suit) and rescue humankind from the grip of its overlords.



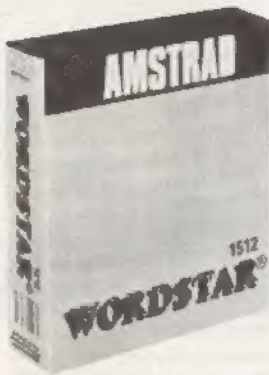
PC software war

THE scramble to supply applications for the new Amstrad PCs is now well and truly on, with Amstrad launching the first four of an intended ten packages, DR producing a further four to bring its Gem-based range up to nine, and Microsoft bringing up the rear with reduced cost versions of its own applications, Microsoft Word and Multiplan expected soon.

The word processing market for the machines will be lucrative, and Amstrad has recognised this by tying up sole rights in MicroPro's Wordstar 1512, specially developed for the machine. The package's user interface is similar to that of Wordstar Easy, the friendlier version of Wordstar launched earlier this year, but according to MicroPro managing director Robin Oliver it's a new implementation of Wordstar.

DR's new packages are Gem Diary, Draw Business Library and Fonts and Drivers Pack at £39.95, and Font Editor at £99.95. An implementation of the Gem Programmer's Toolkit will also be available at £179.95.

The new packages join Draw, Graph, WordChart and



Write (all £99.95), and will link into the Gem packages bundled with the PCs. Amstrad's packages don't do this, and the first few months sales are likely to show whether users will want to opt for a traditional type of system or whether they'll jump for Gem.

Microsoft announced its new products at the PCW Show. They're similar to the full-sized products, but Multiplan Junior is a smaller 63 x 255 cell spreadsheet, while Word Junior lacks Word's outlining, indexing and style sheet facilities. They're both £69.95, while full-size Word is a snip at £500. The company is confident that it hasn't set a pricing time bomb for itself.

Ariola Sega link

ARIOLASOFT has bought the rights to see the Sega video games machine in the UK this Christmas.

Sega's console, the Master System, was launched at the Chicago Consumer Electronics Show in June this year. It uses both card and cartridge software, which have a capacity of 256K and 1048K respectively. Video games machines were one of the surprise success stories of the Chicago show, with Nintendo and Atari both launch-

ing products in that field as well.

Ariolasoft's Frank Brunger said: "There will be some out here in time for Christmas, but we want to build up demand first. It'll be priced at either £79.99 or £89.99 - we're not sure yet."

As well as bringing over software already written for the machine, Ariolasoft intends to put some of its own games on to card and cartridge, including the acclaimed *Skyfox*.

Digitiser for Spectrum

DUTCH company Data-Skip has developed a £69 video digitiser for the Spectrum. The Videoface consists of a small box that alters video signals from a video recorder or camera for display on the Spectrum's screen.

Details from Data-Skip, 1 Willemsteeg 10, 2801 WC Gouda, Netherlands. Tel: 0-1820-20581.

Microlink to the States

MICROLINK, Database Publications' front end to the Telecom Gold electronic mail service, has established a gateway to New York-based online database Mnemonics. Using the gateway costs about half as much as a con-

ventional transatlantic phone call.

Details from Microlink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY. Tel: 061-456 8383.

New printer from Samleco

SAMLECO has added a 132 column printer to its range of low cost dot matrix machines. The DX-136 retails at £402.50 and prints at 120 cps. It comes with tractor feed as standard and provides draft, correspondence and near letter quality modes. As it uses interface cartridges it can be connected to most computers.

Details from Samleco, 9 Fairacres Industrial Estate, Dedworth Road, Windsor. Tel: 0753 854717.

Diary Dates

SEPTEMBER

12-14 September
8th Official Commodore Computer Show
UMIST, Manchester

Details: A wide range of Commodore hardware, software and peripherals.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

26-28 September
Electron and BBC Micro User Show
UMIST, Manchester
Details: Software, hardware and

peripherals for BBC machines.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

OCTOBER

3-5 October
The Amstrad Computer Show
Novotel, London

Details: Home and business software and hardware for the Amstrad range.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

30-31 October
Hampshire Computer Fair
Guildhall, Southampton

Details: Business computers.
Price: Free entry by business registration.
Organiser: Testwood Exhibitions, 0703 31557.

NOVEMBER

7-9 November
Electron and BBC Micro User Show

New Horticultural Hall, Greycoat Street, London SW1
Details: Hardware, software and

peripherals for the Electron, BBC micro and Master series.

Prices: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

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parallel interface version. £10 (+VAT) more will buy a parallel/serial model. For £120 (+VAT), a tractor feed option with both interfaces can be had. I have this model linked to my Sinclair QL, and am very pleased with the results. The GLP II superceded the GLP, and for £130 (+VAT) you can buy the parallel interface version from the same supplier (Rockhall of Glenfield in Leicester).

I feel that the amended information will clarify the ability of the printer. I wholeheartedly agree with Niel Markwick's sentiments: the GLP gives excellent value for money.

Paul Smith
Bath

Luck of the Irish

I was very interested to read the article by David Bolton regarding the Irish Software house, Choice.

For the past 3 years as Level 9's duplicator, I've been using MegaLoad, a turbo loader from Choice Software for their C84 masters.

MegaLoad employs three speeds, 9, 7 and 5 times and each uses a multi-coloured loading screen.

Since starting data duplication back in 1978, I've been offered many very varied and some, very expensive, turbos, but I've found nothing to match this product. Long may they continue to produce!

Simon Stable
Oxon

Electronic repair manual needed

I am a regular reader of *Popular Computing Weekly* and hope your readers might be able to help me through the courtesy of your letters page.

I am very interested in electronics and have been invalidated after an accident. My only outlook for the future lies in bench work repairing electronic equipment.

Could I please ask your readers where I can obtain any service information for repairing computers, monitors, or possibly video, TV or test equipment.

I understand your magazine includes advertisers who carry out repairs but there is

no one operating this service in Derby as far as I know.

Paul Simpson
41 Naim Avenue
Cheddlesden
Derby



"It's an Add-on following the conversion of arcade games to computers"

Romanesque

In my Romans program for the QL (Programming, August 21) there is an omission. It is now necessary to delete line 290 for the program to work.

However, this alteration means that you can only use upper case when typing in the Roman numerals.

David Wragg
Hants

Demolition derby

Thank you for publishing *Demolition on the Spectrum* in *Popular*, June 19.

Unfortunately you omitted to mention how to get the game running once the code is typed in. The following program should achieve this if saved on the cassette before the machine code:

```
10 LOAD "DemoCODE" CODE
20 RANDOMIZE USR 30200
```

Jonathan Davies
Bristol

WACCI club

Many thanks for publishing my letter about an Amstrad CPC user club in *Popular*, August 21.

I have now been able to start the club and I thought I'd write with more details.

The club is called WACCI, and every month I distribute a

nationwide newsletter on tape/disc of members' views and contributions.

The subscription fee for this is a measly £3 per year. Anyone interested should drop a line and a stamp and I'll send further details.

Jeff Walker
75 Greatfields Road
Hillingdon
Uxbridge
UB8 3QN

GAC!!!

Picking up my trusty copy of *Popular*, August 21, I noted with interest a feature on Incentive's *Graphic Adventure Creator* for the BBC. Being somewhat involved in the field of adventures, I was interested to see what GAC was like for the BBC, yet to my horror the article was comparing GAC with *The Quill*. Anyone who can say "Forget *The Quill*" in preference to GAC needs a strong talking to.

The GAC system is good; let me say that first. However, in terms of flexibility and game size it is nothing special, the only feature found in it and lacking in *The Quill* is a decent parser.

Even there, GAC is only a little more advanced. With such a pitiful amount of memory free and serious limitations such as 255 character max location descriptions, it could never have been used to write *The Boggit* which *The Quill* handled easily.

Statements like "For the first time... a utility which can create freestanding programs" are just ridiculous. To the reviewer, Richard Benson, I can only say that some of us are above being impressed by a few pretty graphics and a press release.

I would encourage readers to consider whether they want an old system capable of producing large, high quality adventures or what amounts to an art utility with the 'adventure' bit bolted on.

And if Mr Benson still cannot produce a decent game using *The Quill*, I have one tip for him - read the manual!

Fergus McNeill
Delta 4 Software
Swanmore
Hants

Richard Benson replies: I'm aware of the limitations of GAC, and of the fact that

The Quill outshines it in many aspects. My argument is that GAC is quick and easy to use, and produces illustrated adventures which are more obviously 'commercial'.

The Quill, for all its advantages, needs *The Patch* and *The Illustrator* to produce similarly commercial results.

Whatever the merits of *The Quill*, I think an adventure written with GAC is certainly simpler for non-programmers to produce - and surely that's a strong point.

RSX supplied for Amstrad

With reference to my RSX extension program Xen for the Amstrad (see this week's issue), I would like to add that I will supply the package on tape for £2.50, or disc for £6 if readers are interested. The address is below.

Simon Goodwin
41 Fountains Drive
Acklam
Middlesbrough
Cleveland
TS57 7LW

Quality and power

I am a recent and happy owner of the Memotech MTX512, which I have found to be a beast of quality, value and power. I use it primarily for programming, although I do own several games.

I have some questions regarding Memotech. Is there a Memotech user club? Has Memotech moved, since I have yet to receive a reply to a letter I wrote some weeks back? Can you tell me where I can get books and software for the MTX512?

Chris Ellis
Paignton
Devon

The Memotech user group is called Genpat, and is run by Keith Hook. He can be contacted on 0282 38596.

Yes, Memotech has moved. We don't have the new address, but it can now be contacted on 0993 76251.

For books and software, try Syntaxsoft, whose telephone number is the same as the one given above for Genpat.

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Keep taking the tablets

Peter VanDoorn examines the potential of home video creation with the Pioneer PX-7 MSX computer

When you've seen one MSX computer, you've seen them all, right? Well, frankly, no. I must admit this was my point of view, until I saw the Pioneer PX-7 computer. So what's so different with this one? Well, for a start, it has the ability to overlay its own screen, both graphics and text, on top of an incoming video signal, and to output this to another video recorder.

The computer itself comprises two units, the keyboard being separate from the cpu. This main unit houses all the firmware and connections for both video in and out and stereo sound. Whilst rather large in micro terms, it is obviously designed to blend well with other video or hi-fi equipment.

The main feature of this unit is to provide ten screen "wipes" (used to avoid sudden scene changes and fades not normally available to the home video buff). These wipe in the standard ways: single vertical or horizontal, dual vertical or horizontal (a shutter effect) as well as unique patterns like a venetian blind effect and a dot matrix "explosion".

When the screen is wiped, a stored screen is brought back onto the screen, overwriting the video picture already there. Titles and pictures, or perhaps business graphs and charts, can thus be brought onto the screen in a very smooth and effective way.

The computer's text can be superimposed on to the video source in one of fifteen colours, thus enabling easy post-production titling. As all video movie enthusiasts know, this is very hard to achieve without expensive equipment. The text, whilst only being of one character font, can be virtually any size on the screen, ranging from the normal size (8x8 pixels) to one character taking up the entire screen (256x192 pixels).

Graphics as well as text can be superimposed on top of the video, enabling the user to add diagrams to business promos, or perhaps even a map to go with a video of the family holiday. MSX has 256 sprites, so simple animation is possible to liven up presentations. As an optional extra, the PX-TB7 Video Art Tablet and accompanying Rom cartridge makes drawing on the screen much easier (being a touch-tablet with small stylus).

The Rom software is quite comprehensive, having a small pull-down type menu which provides access to all line and shape (circle, box, fill, etc) drawing.



It also provides a simple sprite designer. When the artwork is complete, a separate menu on a plastic overlay sheet for the tablet (thus keeping the screen clear) enables the previously drawn picture to be brought on and off the screen in the aforementioned wipes, making editing of video material that much easier.

Naturally, all the wipes are available from Basic, and Pioneer provide a special extension to standard MSX Basic, called P-Basic. This also provides direct remote control of Pioneer's LD-700 and

cartridge, leaving 64K for the user.

The main cpu has connections for not only video and audio in/out, but also TV, RGB monitor, a cassette recorder, two MSX cartridges, system control (for the video disc), Centronics printer, keyboard, two joysticks and stereo headphones - phew! The main unit also houses two speakers for the stereo sound.

However, it does have one glaring fault! That is, the computer's screen only takes up the middle two-thirds of the TV screen. This means that it is impossible

"The PX-7 is, of course, a fully fledged MSX compatible computer, meaning that it is able to run all MSX software and peripherals"

LD-1100 Laserdisc video disc players, paving the way to cheap, interactive video games.

It is also possible to control the three levels of computer/video mixing, ie, superimpose, video only and computer only, from Basic although three special keys are provided on the keyboard for manual control.

The PX-7 is, of course, a fully fledged MSX compatible computer, meaning that it is able to run all MSX software and peripherals. The machine comes with 48K bytes of Ram, 32K which is available to the user, and 16K used as the Video Ram. This is upgradable to 80K, with the addition of a 32K Ram

to wipe or write to the whole of the available TV screen! This limits the PX7's applications somewhat, as it cannot be used as a true wipe generator. However, the screen is perfectly large enough for titling, credits and labelling (that is, if the object to be labelled is at the centre of the picture) and some very professional effects can be produced.

Hardware Pioneer PX-7, PX-TB7 graphics tablets **Price** PX-7 £299; PX-TB7 £89 **Supplier** Pioneer High Fidelity Limited, Field Way, Greenford, Middlesex UB6 8UZ (01-575 5757).

The proof is in the printing

Dave Race explains how to expand your Amstrad DMP 2000's buffer to 8K

Amongst other great features the Amstrad DMP 2000 printer comes complete with a 2K buffer, which stores characters sent from the computer and allows the computer to carry on computing instead of having to wait for the printer to finish printing.

Unfortunately it is not really a 2K buffer, despite there being a 2K Ram chip inside the printer. This is because the printer uses some of this memory itself and some is used for the line buffer, which stores the line about to be printed.

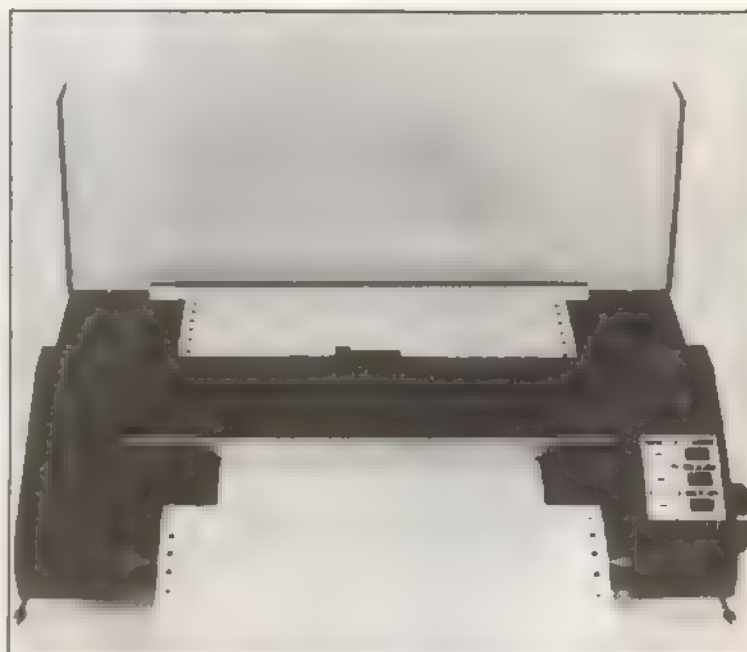
In fact the actual printer buffer is only half a kilobyte which obviously won't store very much text at all, slightly less than this paragraph in fact. This means that in reality your computer will still have to wait for the printer to catch up with it.

However, I have discovered that it is possible to expand the printer buffer some seven fold, thus allowing reasonably large chunks of text to be sent to the printer without holding up the computer.

It should be noted that fitting this extra memory will almost certainly invalidate the Amstrad warranty and so should only be carried out on machines over a year old, or by owners who don't mind paying for any repairs if their printer goes wrong. That warning out of the way, on with the instructions.

The extra memory comes from fitting an 8K ram chip in the printer in place of the 2K chip already there. The chip you will need is a 6164, available from RS (ref 301-870) for about a fiver. Also you will need a small Posidrive screwdriver, a small flat bladed screwdriver, a sharp blade (a scalpel is perfect), and a soldering iron with a fairly small tip.

To begin with ensure that the mains lead is unplugged. It is not sufficient to simply switch the printer off, and you must check there is no paper or ribbon in the printer.



Now turn the printer over so you have access to the bottom (you'll probably want to put the lid to one side). You will be able to see six Posidrive screws, three at the front and three at the back, unscrew and remove these - and put them somewhere safe. Turn the printer back over and remove the top half; this is best done with the friction/tractor switch in the friction position. Lift the top half up, tilt it forward, and you will see that there is a ribbon cable going from the push button panel to a printed circuit board in the bottom half. Unplug this at the PCB end and you will be able to remove the top completely.

If you examine this PCB you will see six more leads going to it. Remove all these carefully, making note of where each goes. You also need to unscrew the two Posidrive screws that seem to be holding the Centronics connector in place. The PCB can now be removed by lifting it up from the rear and pulling it out backwards. Place the PCB on your work surface, preferably on a piece of cardboard to give it some protection. It should not be placed on a metal surface.

Remove the 2K Ram chip (see figure two). This is best done by levering the chip up at both ends in turn with the flat bladed screwdriver until it comes free. The 8K chip goes in the socket you have just emptied. If you look closely at the

The table below shows just how great an increase in memory is provided

Mode	Internal Ram	Receiving buffer	Line buffer	Download characters	Dipswitch 2-3	Dipswitch 2-4
Character	2	0.5	0.9	0	off	off
	8	6.5	0.9	0		
Graphic	2	0.4	1.2	0	on	off
	8	5.7	1.8	0		
Download	2	0.2	0.9	32	off	on
	8	3.6	0.9	256		
Download Graphic	2	0.2	0.9	32	on	on
	8	2.7	1.8	256		

Figure one - J3 viewed from solder side of board

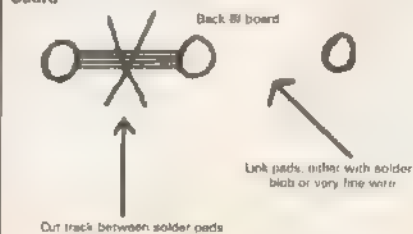
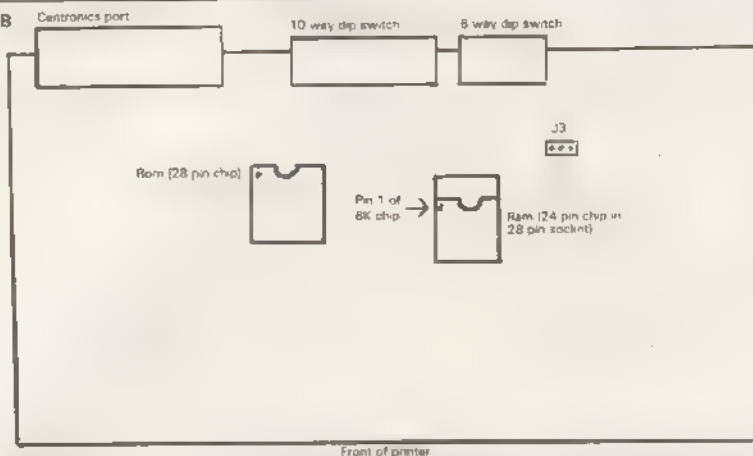


Figure two -- printer PCB



chip you will see it has a small indentation at one end, which must be orientated the same way as in the diagram, ie, with the indentation towards the rear of the board. When inserting the chip it is very important to check that no legs are bent. It is also a good idea to touch something that is earthed before handling the chip as it is quite sensitive to static electricity.

Now comes the bit that the warranty won't like. Locate the three pads marked

J3 on the top of the PCB, turn the board over and find them on the back, they aren't marked on the solder side. You will see that one of the pads is tracked to the centre one (see figure one), and you must cut this track. Be very careful not to cut any other tracks, but on the other hand ensure that the two pads are no longer joined. Next join the other outer pad to centre one, this is best done by soldering a piece of mod wire between them but could be done with just a blob

of solder if you are careful. Obviously you should not join any other tracks together in the process. It is advisable to check your handiwork very carefully, with a magnifying glass if necessary.

The printer can be put back together now in the reverse order to the instructions above, being careful not to damage any of the cables going to the PCB. Once back together power the printer up and try sending a listing to it. You should be able to see quite an improvement.

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Getting to First Base with Minerva

Minerva Systems is attempting to address the problems of getting to grips with databases, spreadsheets, etc., for the uninitiated with a series of 'Learner Friendly' packages.

First Base is one such in the range, a fast but simple database for the PCW 8256/8512, with a clear, concise manual.

However, one huge asset of *First Base* is the inclusion of a mail merge facility for use with *Logoscript* documents, and it may well be worth a look for this alone.

The size of records you create is limited only by the size of the screens; each record can have a maximum of 255 fields, each field up to 80 characters. Setting up a design for a database is easily done.

Once the database has been created, the records are automatically sorted alphabetically, according to the

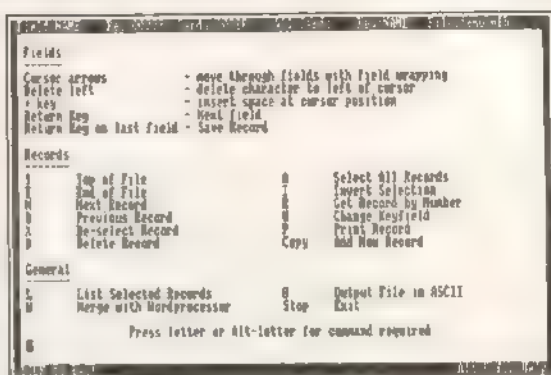
field which was designated the key field.

The database can then be searched and sorted into subsets: for example, a subset of all people living in London on a mailing list database.

'Inverted' subsets are also catered for, all those who don't live in Manchester, for example. You can also search for particular words occurring in any field on any record.

First Base is not relational in any way, nor is there a built-in calculator. Minerva's idea appears to be that potential database users should buy *First Base* to find out what databases involve and then move on to one that suits their needs more specifically.

However, *First Base* is not in any way a tutorial program. I would say it is useful for any one with a small and uncomplicated database to compute, particularly a small mailing list, with its mail



merge with *Logoscript* features.

It certainly can't be faulted because of its limitations, because Minerva makes no claims for it to be anything grandiose. I must admit, it is extremely refreshing to read in the manual itself of the limitations of *First Base*, and why the user would then

want to buy something more sophisticated!

Christina Erskine

Program First Base Micro PCW 8256/8512
Price £29.95 **Supplier** Minerva Systems, 69 Sidwell Street, Exeter, Devon
Tel: 0392 37756.

Bridging the card games gap

With *Colossus Chess* going from strength to strength in all its versions, CDS has decided to spread its wings a bit with *Colossus Bridge*.

Bearing in mind that contract bridge often evokes (not very accurate) images of golf clubs and baize tables, CDS has gone to town with the packaging.

The box includes the excellent book *Begin Bridge* by G C H Fox, which together with the sample hands demonstrated on the reverse of the tape, makes this a suitable program for beginners, an order form for Systema chess, bridge and backgammon electronic games, and a subscription offer for *International Popular Bridge Monthly*.

Of course, the program itself, which, claims the accompanying literature, plays "at good club player level", is in there too.

Colossus follows the format of previous bridge simulations: you play one hand, the computer the other three,

"Its greatest strength is the sheer range of practice and cheat options... these make Colossus the best bridge practice program yet"

through the bidding and the play.

Probably its greatest strength is the sheer range of practice and 'cheat' options: rebidding, resetting your original speed and distribution parameters, inputting your own hand, replaying a hand, asking the computer to play a card, claiming some or all of the remaining tricks, getting the computer to play the entire hand. All these make *Colossus* probably the best bridge practice program yet.

Some of the options, in fact, are almost too detailed. You can set the computer's response rate at any number between one and 28 - and I found anything below 16 too

fast!

For the bidding, the program follows the principles of Acol, using a weak opening no trump, and Stayman, Baron and Blackwood conventions. Generally it is sound, with occasional eyebrow-raising bids—nothing too dissimilar to real life in fact.

As for *Colossus's* card play, it follows the generally understood opening lead conventions and from there on plays fairly solidly and predictably. It finesses - sometimes - draws its trumps and doesn't throw away winners.

Programmed by the team which developed CP's latest *Bridge Player* for the PCW 8256/8512, *Colossus* is similar in format with a number of

improvements. There is now a full score sheet, for example, and the computer will initiate conversions such as Blackwood.

Altogether, *Colossus* measures up extremely well to most bridge simulations. It has a range of options to beat them all, and plays well enough to satisfy most people.

CDS hopes it will attract the attention of non-bridge players who want to learn. The accompanying book and sample hands will certainly help in this respect, if you are determined to go alone. At least, when learning this way, no-one is going to shout at you, but it can still be a lonely and frustrating business.

Christina Erskine

Program Colossus 4 Bridge Micros Amstrad CPCs (Spectrum conversion expected) **Price** £11.95 cassette, £14.95 disc **Supplier** CDS Software, CDS House, Beckett Road, Doncaster, S Yorks.

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Trivial Pursuit was programmed by Oxford Digital Enterprises.



DOMARK

Atari hits on four favourites

A belated leap for the compilation bandwagon comes from English Software with four GIANT Atari aces, as they like to call them on the inlay. What you get for your tenner then, are *Elektraglide*, *Mediator*, *Quasimodo* and *Chop Suey*.

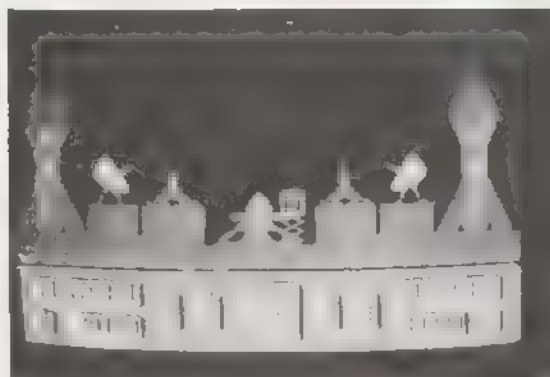
Well, it's not the most exciting of compilations but none of the games are actually bad. *Elektraglide*, the 3D driving game is probably the best of the bunch although it is starting to look a little dated now.

Quasimodo involves throwing boulders from the battlements then swinging from bell to bell, all to the accompaniment of a reasonable jingle. Regardless of what it

was selling at before this has all the characteristics of a current day budget title.

Hack, chop, kick, urgh. *Chop Suey* is your basic martial arts game. Graphically okay.

The last game in the package, *Mediator*, is probably the most interesting game to play, even if the instructions give you little idea of what the hell you're supposed to be doing. You take off in scene one from a large circular space station in a tiny ship. The objective is then not to dock with the other station but to head down the screen, which scrolls as you descend, towards the force field which lurks down there. After you have bombed a hole in it and passing through you must



Mediator: the most interesting

dock on a landing pad, whilst avoiding anti-spaceship fire.

After docking the action goes into 3D for the next couple of scenes, which include, after you've fought off some mutant trees, an *Entombed* look-a-like.

Overall the package can only really be considered value for money if you don't already own any of the games. This is hardly a GIANT compilation, it's more

of an average height collection.

Popular Appeal ♦ ♦ ♦
Duncan Evans

Program Atari Smash Hits
Micro Atari 400/800/
XL/XE Price £9.95 **Supplier** English Software, 1
North Parade, Parsonage
Gardens, Manchester M60
18X.

Alleykat racing

Possibly the most eagerly-awaited follow-up of time, *Alleykat* has a hard job to outshine Andrew Braybrook's massive hit *Uridium*.

Alleykat is a racing game, very much *Uridium*-turned-90 degrees. The object-littered landscape moves vertically, while you control a racing ship which can gain height, zap obstacles and change to fighter mode to eliminate particularly dangerous hazards.

Energy nodes and money bonuses can be collected by skimming over them, while a variety of novel groundcraft and the lethal katterkiller have to be shot or avoided.

There are several different landscapes to compete over, and many different kinds of race: slalom, survival, demolition and so on. Only if you complete a certain number of laps can you gain a bonus and qualify for the next round of the challenge.

The usual clever title screens, complex sound effects and polished music combine to make *Alleykat* another sure-fire hit, but it

hasn't the impact of *Uridium* and gives the impression of having been rushed out to capitalise on the success of its predecessor.

Popular Appeal ♦ ♦ ♦ ♦
Chris Jenkins

Program AlleyKat Micro
Commodore 64 Price
£8.95 **Supplier** Hewson,
566 Milton Trading Estate,
Milton, Abingdon, Oxon.



C16 game in the running

If it's a hard life being a C16 owner, it must be even harder writing for it. Limited memory, no hardware sprites and a not-very-good sound chip. Despite these limitations, however, an increasing amount of C16 software is verging towards what might be called respectable on other machines - and much of it, like *Monty on the Run*, comes from Gremlin Graphics.

Monty on the Run was originally a straightforward 'platforms and ladders' job on the

64 - with the added advantage of a fabby soundtrack from the then almost undiscovered Rob Hubbard - which dragged the game from the category 'competent' to 'excellent'. Alas, the C16 version does not have this soundtrack, and it's got a fair few less screens than the original, too (a total of 30). But on the plus side, what you have got here is a well designed, nicely thought out little title that, while offering nothing startlingly new, will keep you occupied for a few

of the winter evenings that will soon be upon us.

Just about polished enough to justify the price, if you enjoy games of this type, you won't be disappointed.

Popular appeal ♦ ♦ ♦
John Cook

Program Monty on the Run
Micro C16 Price
£8.95 **Supplier** Gremlin
Graphics, Alpha House, 10
Carver Street, Sheffield S1
4FS.

Johnny Reb II comes marching in

Was *Johnny Reb* the first real wargame simulation for the Spectrum? Probably, but who can remember from this point in history? But whatever the chronological order of things might be, Lothlorien's name remains in the forefront of wargame software writers. This new program drags that great old game into the modern era, while the essential details remain the same.

Gameplay takes place in the American Civil War, and follows the efforts of a strong Confederate force sweeping from left to right of the play area, attempting to break through a lighter Union force (ie, move from screen left and exit screen right with fewer

casualties than the defending force). As in the original, a river runs from north to south, and the Confederates must cross this hazard under fire from the defending Union troops.

The default set-up is pretty bare, with just a couple of hills and roads, plus some houses; but the new version allows the player (or players) to create fences, walls and buildings at will, although the landscape must remain the same. Similarly, the composition and names of both forces can be tailored to the players' requirements.

To reflect the *ad hoc* make-up of the opposing armies in the conflict (drawn from both regular soldiers and raw re-

cruits), units possess several degrees of strength, experience and morale, which change as the battle commences. Four types of units are available to both sides, namely, artillery, infantry, cavalry and supply.

Play is via joystick or cursor keys (which can be re-defined) — as the 'cursor box' is moved over a unit, the details of that unit are displayed, and a range of options available, including orders to move (firing or not), dig in, charge and so on.

Graphics are large and very well drawn, and there is a green screen option. Instructions are adequate, though no mention is made of how to save a game in progress,

though trial and error will tell you that you can break in to a menu at certain stages. Beware, however, of saving to a disc — for some reason, the disc is re-formatted (without warning) to IBM format!

Overall, not very demanding, but the re-design facility will ensure that the life of the game can be greatly extended and more and more complex situations set up.

Popular appeal ♦♦♦♦

Tony Bridge

Program *Johnny Reb II*
Micro Amstrad CPCs
Price £9.95 **Supplier**
Lothlorien, Victory House,
Leicester Place, London
WC2H 7NH.

Moonlight Madness for insomniacs

The plot to *Moonlight Madness* is so flimsy I won't bother boring you with it. Suffice to say that this is a collect the sixteen keys and open the safe game with a thrilling 2D display and single colour graphics.

So, off you go, leaping from platform to platform, pressing things, avoiding other things, watching great chunks of the background disappear to avoid attribute problems. In fact the only thing that is remotely interesting about this appallingly tedious game is the tune.

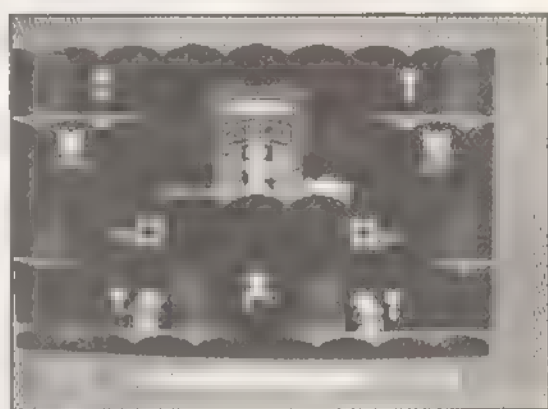
At first it sounds all right, if

little monotonous, then begins to grate the nerves. After a while it begins to take on all the appeal of the Chinese water torture.

If you have trouble getting to sleep at night then this represents a surer method than counting sheep of getting some kip.

Popular Appeal ♦
Duncan Evans

Program *Moonlight Madness* **Micro** Spectrum
Price £7.95 **Supplier**
Bubble Bus Software, 87
High Street, Tonbridge,
Kent TN9 1RX.



Tennis, anyone?



Just when you thought it was safe to retire to your armchair, yet another sports simulation pops up. This one is the unseasonal *Tennis*. Programmed more in a 'cartoon' style than as a simulation, the one-or-two-player singles-or-doubles contest presents the court from one end, and allows full keyboard or joystick control of the players' movements. Scores are shown at the right hand side of the court, with overall results at the top, and all the rules of tennis are adhered to.

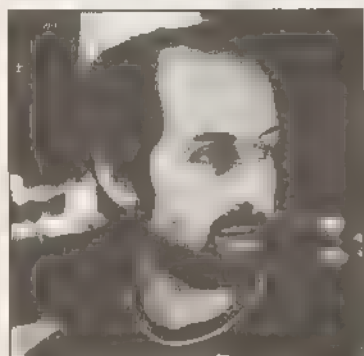
Unfortunately there's little skill involved in the game, since all you have to do is hit

the fire button twice to serve, then position yourself in vaguely the right position and thrash at the return. There's no way to control the power of your shot, choose forehand or backhand, produce spin, or whatever.

There is some element of timing involved, but it's all too easy to get involved in endless and unexciting rallies in which the ball is just tonked back and forth across the net.

Popular Appeal ♦♦♦♦
Chris Jenkins

Program *Tennis* **Micro**
Spectrum **Price** £9.95
Supplier Imagine, 6 Central Street, Manchester.



Interplanetary influences

Tony Bridge returns to Adventure Soft's Rebel Planet – plus a sneak glimpse of Fergus McNeill's latest opus

Some weeks ago, the Grand Elf had a look at *Rebel Planet* from Adventure Soft UK; lack of space that week meant that the look was more of a sidelong glance. Here's the rest of the piece along with a (rather more than glancing, I hope) look at a *Quill'd* game from a non-professional software house.

I had a lot of fun with *Rebel Planet*: the graphics are good to look at, with a certain of animation, and the puzzles are interesting and complex without being stupidly opaque and obtuse. I would still like to see more atmospheric descriptions, but I suppose that there has to be a trade-off somewhere between graphics and text – and the wait between command input and the re-appearance of the cursor can be annoying, particularly after playing a recent Level 9 opus, in which its version of multi-tasking makes waits like this a thing of the past. But the storyline is excellent and there are plenty of things to divert the attention, like pressing buttons on the limcom strapped to your wrist (attends to certain functions as well as giving information on personal as well as mechanical status), and trying to open those damned cargo containers can be really frustrating.

The £9.95 price tag means, as it should, that *Rebel Planet* is bug-free (as far as I could see) and that the packaging is good. It is a pity that *Ram save/load* is not supported – but the extra commands and the flexibility of the language makes this story worth looking at.

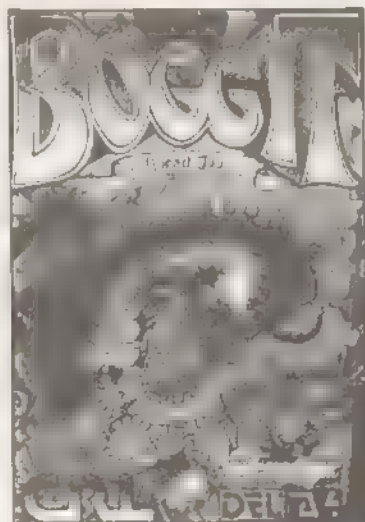
Terry Braverman will be known to Corner addicts from his contribution to the recently-released *Ten-Pack* from Automata; the title of that story was *Royal Adventures of a Common Frog*, a well-written satire using the *Quill'd* (and in good company, I might add, with Bob Franklin's *Here be Tygers*).

That utility has been used again to write a story for his own label, Venturesoft: the scenario of *The Eleventh Hour* concerns a bomb-scare at Hartridges of London – of course, you, the bomb-disposal expert, have been volunteered to enter the store and defuse the bombs. Bombs? Well, these are the work of the mad janitor, who hasn't had a pay rise for many years, and there is one on each

floor, set to explode after a certain time.

■ you happen to be on the same floor as an exploding bomb – bye bye; otherwise, you're okay for the moment, but you'll find the structure of the store weakened. The janitor himself is wandering the empty store, babbling in his dementia, and toting a loaded shotgun – waiting for a poor sucker, I mean bomb disposal expert, such as yourself!

The Eleventh Hour is also *Patch'd* and



The Boggit – see below for more McNeill details

Illustrated – the graphics are very good and quite up the standard of *Rebel Planet*, although the *Illustrator* doesn't allow for very fast drawing. All the *Patch* sound effects (phone rings and so on) are pressed into service, and these can get a little boring at times as they take up quite a lot of time.

Although you can turn the pictures off, you are lumbered with the sound effects. However, the program is blessed with *Ram save* and *load*, as well as unique commands like *Bombs* (number defused) and *Time* (taken so far). Graphics may be switched on and off with the simple to remember *Pictures* or *Words*, which is a lot better than *On* and *Off* and other

such concoctions.

The adventure is quite large, with lots of objects to be picked up and used. Some are red herrings, but most require careful manipulation and must be used in the correct sequence, which is where *Ram* memory comes in particularly handy.

Although the location descriptions are rather brief, atmosphere drips from the program two reasons for this – the feeling of being in a large department store is well created, with all the usual nooks and crannies of the leather goods, the restaurant, the paint store, the pharmacy, general office, accounts departments and so on, and on top of it all, that janitor roving around, likely to appear at any moment, and those bombs ticking, ticking away...

Although I enjoyed the adventure immensely and found the ideas of the plot interesting and unusual (and at £3.99 it is certainly this side of good value), I had a few doubts about the tastefulness of the project: what with bombs in large department stores, and Hartridges being hardly an impenetrable disguise.

Adventure Soft UK, Distributed by US Gold, Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7. Venturesoft, 23 Aragon Close, Kings Hedges, Cambridge CB4 2SU.

Fergus's latest

Now to an adventure that hasn't been released yet, in fact is still in the process of being written.

Fergus McNeill can't sit still! Now that he has a superb hit with *The Boggit*, he has turned his attentions to more recent fantasy fiction. *The Colour of Magic* is a novel by Terry Pratchett – I haven't read it yet, but I have seen some of the game that Fergus has constructed around the book, and it's another winner. The two main characters are Rincewind and Two-flower, but there is a grand parade of others including a piece of luggage that walks on a hundred legs and the old spectre himself, Death. The story is spread over three parts, so if you want to be one jump ahead, start badgering your local library now for a copy.

ADVENTURE HELPLINE

Robin of Sherwood on Spectrum. Where and how do I find Siward the Thief? How do I enter the grange? Peter Van Wingerden, Dierenriem 24, 3225 EC Hellevoetsluis, Holland. Help offered on Lords of Time, Lords of Midnight, Doomdark's Revenge, Golden Apple, worm in Paradise, Emerald Isle.

See-Kah of Assiah on Commodore 64. How do you escape from the castle when the huge bird arrives? Paul Stratton, 32 Hy Regt RA, BFPO 20.

Starcross on Commodore 64. How do I get the blue rod from the silver

sphere, and still have enough power in the gun to get to the control bubble? David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Zork I on Commodore 64. What do I do with the brass bauble, and how do I finish the game? David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Zork III on Commodore 64. How do I get past the statues of the guardians? David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Snowball on Commodore 64. How do I wake the man to get the password? David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Exodus Ultima III on Commodore

64. I have mapped and searched all the dungeons but I cannot find the mark of the snake. Help! David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Suspended on Commodore 64. I have replaced the faulty wire but I still cannot reset the system. Also I cannot find the wire cutters. Please help. David Stewart, 3 Avenue des Linottes, 1160 Brussels, Belgium.

Zkul on Sinclair QL. How do I get across the underground lake; I can't find the ock Pete Coombes, 2 Castledene Crescent, Parkstone, Poole, Dorset. BH14 8DP

The Pawn on Sinclair QL. 1) How do I pass the alchemists? 2) How do I open the door under the tree? 3) What use are the red, green and blue? Michael Scott, 10 Hough Green, Chester, CH4 8JG

Robin of Sherwood on Amstrad. Where can you find the Holy Crest, and where do you find the 400 gold pieces? Gavin Lennon, Wattle Bridge PD, Newton Butler, Co Fermanagh

System 15000 on Spectrum. I would like any information on playing the game that anyone can offer, Steve Chapman, 8 Oak Gardens, Ivybridge, Devon, PL21 0NB

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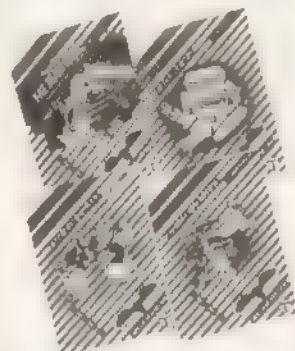
lem, send it to us, and a fellow adventurer may be able to help.

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Finding the Pharoah

Tony Kendle peeks into the mailbag and finds some pokes

Here's a letter from Alasdair MacDonald of King's Lynn concerning the new QL game from Talent, *The Last Pharoah*. Knowing how much you like finding decent QL games I'm sure you will find the following infinite lives poke invaluable.

"To get the extra lives you need to write a slightly altered boot program which contains the required poke in. To see the original boot program just type 'copy mdv1_boot to scr'."

```
Your new version should read
10 CLOSE#1:CLOSE
#2:MODE 8:c=RESPR
(RESPRQ)-187218:
c=187384 LBYTES
mdv1_pharao_scr,
134272:LBYTES mdv1_
coda.c:POKE_W
191178, 21418. CALL c
```

"Make sure you type 'POKE_W' or it won't work."

"A further way to avoid being killed in the game is to press ALL keys in KEYROW(1) - all four cursor keys, space bar, ENTER and back slash (top right of the keyboard) and lastly Escape. This removes all baddies but if you get stuck you will be unable to abandon the game by pressing escape."

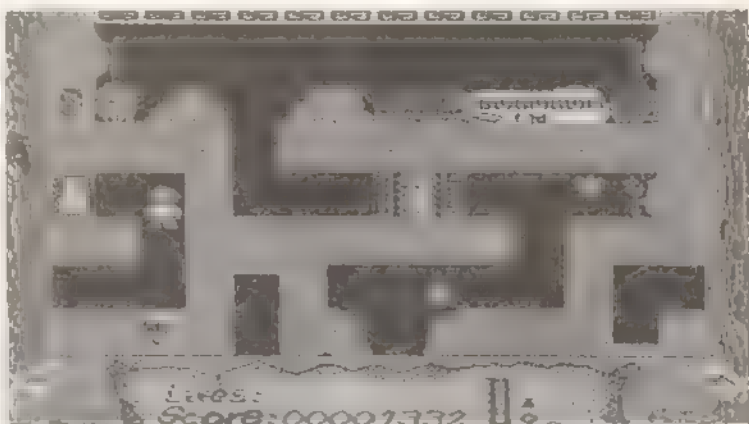
"The game itself consists of a very large maze - I've visited at least a hundred screens so far. I've now almost finished it - unfortunately some keys and the wall 'paintings' which change colour and gain points only appear after one has visited a particular room or something, so it's difficult to know where to look for the remaining keys. Eventually you get to a stage where you're stuck having used up all your keys, not knowing where else to look."

"I've also just completed Split Personalities on the C64. The technique for solving the game is to get lots of bonuses on the easier screens since every last picture takes so long and will undoubtedly involve loss of at least one life. The pictures are Reagan, Thatcher, Kinnock, Sir Clive, Sugar, Bogey (an awful picture), Charles and Di, Andy and Fergie and lastly Monroe. To complete Monroe you have to get all the pieces from the left hand side and bottom row out in order but make sure there is an easy way for getting rid of bombs and if a piece comes out which isn't from the two edges mentioned don't crowd up the board with it - get rid of it."

"It is an excellent game but nothing exciting happens when you have finished Monroe and the high score isn't even saved (I've had around 300000). Inci-

led." Thanks for your helpful advice Alasdair, write again soon.

To finish this week here's a tip from the horse's mouth, as it were, of Incen-



dentally the gun and bullet pair are worth saving for accumulation of points - put them aside and once you've got most bonuses from the screen push them together and your bonus score is doub-

led. tive Software - enter IAN as the high score on the Off The Hook version of Splatt! and you should find you have access to the cheat mode and thus every level.

Charts

Top Twenty

- 1 (1) Speed King
- 2 (2) Thrust
- 3 (4) Ghosts and Goblins
- 4 (4) ACE
- 5 (5) Ninja Master
- 6 (8) Green Beret
- 7 (16) Kane
- 8 (9) Dragon's Lair
- 9 (-) Knight Rider
- 10 (6) Ninja
- 11 (14) Video Olympics
- 12 (15) Formula One Simulator
- 13 (10) Molecule Man
- 14 (7) Hole in One
- 15 (-) Dan Dare
- 16 (19) Kick Start
- 17 (20) Dynamite Dan 2
- 18 (18) Jack the Nipper
- 19 (-) Skool Daze
- 20 (13) Leaderboard

Mastertronic
Firebird/Superior
Elite
Cascade
Firebird
Imagine
Mastertronic
Software Projects
Ocean
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Mastertronic
Mastertronic
Mastertronic
Mastertronic
Virgin Games
Mastertronic
Mirrorsoft
Gremlin
299 Classics
US Gold

Figures compiled by Gallup/Microscope

POPULAR COMPUTING WEEKLY/21

Name that sci-fi movie still



Picture 1

What you have to do

Science Fiction movies are the theme of this competition, which will run for five weeks. Each week, we'll print two still photographs from well-known SF films. All you have to do is identify them - it's as simple as that.

Don't send anything in yet; remember there are six more stills to come.

Study the photographs shown here carefully. If you think you can identify the films from which they were taken, then you're off and running. Keep this page handy - you'll need it in four weeks' time.

Don't give up yet. If you don't recognise the pictures - we just might give out the odd clue in the final instalment of the competition!

Picture 1: An easy one to get you started

Picture 2: Which film featured these strange characters?



Picture 2

Ten Star Micronix printers

50 Magnum joysticks

First prize

The long-awaited Sinclair/Amstrad machine is here, with all the best features of both the Spectrum and the CPC micros.

The Spectrum Plus 2 operates like a 128K Spectrum, but has a full-travel keyboard, built-in tape deck, RGB, RS-232 and MIDI ports and an expansion facility for microdrives.

The Plus 2 also has twin joystick ports, and will have a range of disk drives and other peripherals available. Retail price is £149.

The prizes of *Popular's* autumn competition this year are really hot!

We've got five (yes, five) brand new Spectrum Plus 2 machines to give away to the top winners this time.

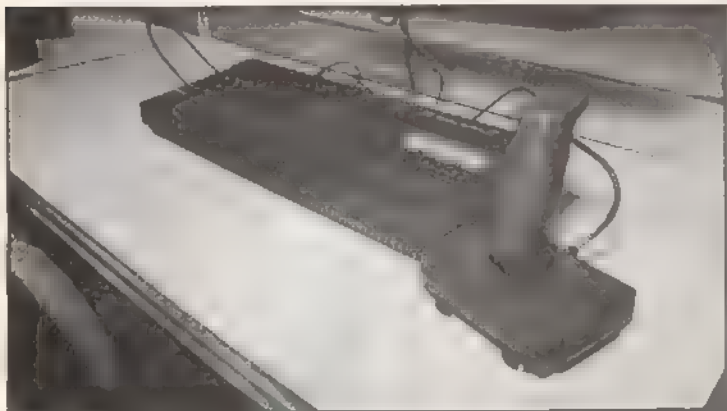
But don't despair if you just miss out on the first prizes, because the next ten winners will receive a Star Micronix STX-80 printer.

Then there are 50 Mastertronic Magnum joysticks to the runners-up. New on to the market, the Magnum is the joystick everyone's talking about at the moment.

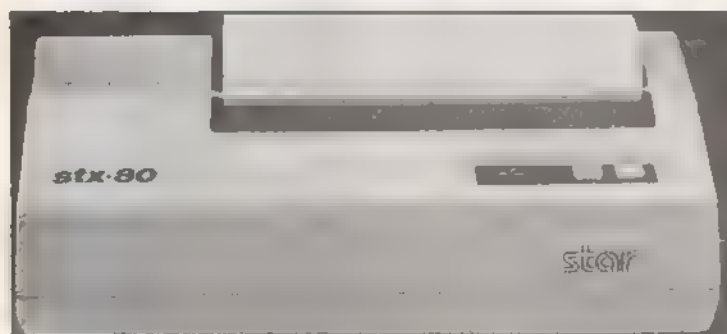
Five Spectrum Plus 2s

Second prize

Budget software champions Mastertronic have now come up with an excitingly advanced joystick which will make the most of your games-playing skills. Ergonomically designed for right- or left-handed players, the Magnum features high speed electronic switching, a fast-action trigger, counter-balanced "pistol-grip" handle, steel shaft and bearings and extra-long cable. Compatible with Commodore, Atari, Amstrad and Sinclair micros (with suitable adaptor), the Magnum normally retails at £12.50.



First prize: The Spectrum Plus 2.
Five to be won.
Second prize: The Star Micronix printer. Ten to go!
Third prize: The Magnum joysticks: 50 for the runner-ups



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Promises, promises...

John Lettice on the wealth of new hardware at the show

Promises are going out of fashion, if last week's PCW show is anything to go by. Shows in years gone by always used to have a substantial contingent of starry-eyed optimists, promising staggering new products Real Soon Now (RSN), but nowadays sadder (and sometimes wiser) manufacturers actually have the products finished, and on display. Some of them even have them in the shops.

Alan Sugar's Amstrad has been one of the main influences on this reformation of the micro market, and true to form the new PC range (see last week's issue for full details) was there in force, and allegedly on display in branches of Dixons.

Amstrad's stand was packed to capacity, giving the impression that someone in the heart of the throng was shouting "free money", but the draw was the fact that the new machines were more than living up to expectations.

"Amstrad's stand was packed to capacity... the new machines were more than living up to expectations"

They're fast in operation, and running Digital Research's Gem windowing environment do a creditable impression of Apple's Macintosh. The machines' display controller is one of the major things that will make them stand out from the crowd, as even the monochrome versions will support graphics, while most entry-level PC clones will need a more

sophisticated display controller to run a graphics package like Gem.

Until its rivals wise up and fit high-res controllers as standard Amstrad is liable to have the graphics field to itself, and will be flogging Gem for all it's worth in its sales pitch.

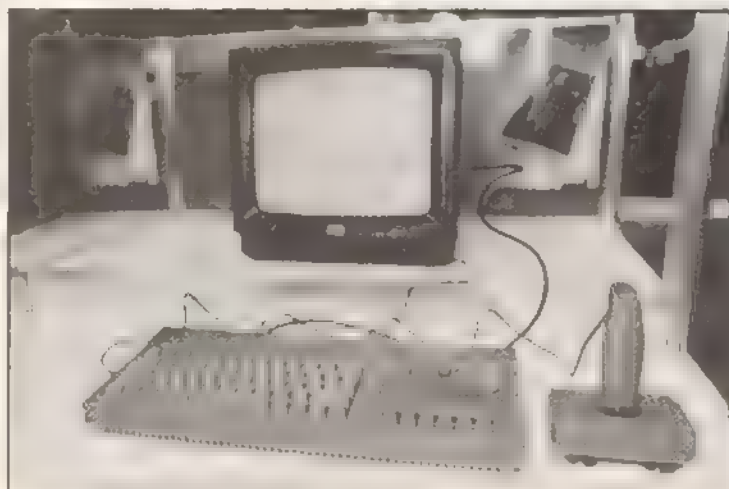
The Sinclair stand next door was less well-populated despite the presence of the new Spectrum Plus 2 and the Amstrad CPC machines, now apparently relegated to the games division.

The new Plus is a tidy implementation of the old Spectrum standard, and although purists will deplore its new colour scheme of Amstrad grey rather than Sinclair black the full travel keyboard and built-in tape recorder should make it a good seller this Christmas.

Acom's new machine, the Master Compact, looks attractive, although it's pricey by the standards of the Amstrad PCW. The basic machine with single 3½ inch drive comes in at £441.25, a version bundled with monochrome monitor costs £537.85, while a colour monitor model will set you back £687.35. At these prices the Compacts aren't going to stop hearts round at Amstrad, but they should be of interest at least to Acom enthusiasts.

Tatung's new machine, the Einstein 256, is a more overt challenge to the Brentwood contingent. It's priced at £444 for a 256K machine with single 3 inch drive and colour monitor, and although it's not directly compatible, ACC was displaying a £19.95 PCW emulator on Tatung's stand.

On top of this it's compatible with the previous version of the machine (now being knocked out for £229), and has an



The Spectrum Plus 2: should sell well this Christmas

amazing all-singing, all-dancing video chip that should do the most incredible things, just as soon as the software houses figure out how to program it. This chip is also to feature in Memotech's new machine, which is due for launch shortly.

One machine that didn't quite make it to the show was the QL, which remains in limbo for the present. It appears that Amstrad was willing to sell the rights to the machine, but has backed off again. The company may just be keeping its options open, but could also be considering relaunching the machine.

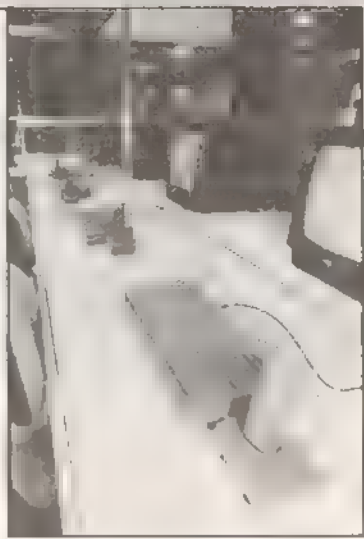
CST's Thor upgrade for the QL, which currently seems to be the machine's best hope for survival, was, however, being exhibited, and he expects to be able to deliver with or without Amstrad's co-operation. The company claims 30,000 circuit boards for the machine are still in existence, so feels it can continue selling the Thor, which is basically a QL upgrade, for some time.

As predicted, Commodore used the show to launch the 64c, but as the company was in the Business rather than the Home Hall it fell to third party companies like distributor Lightning to show



Amstrad's Sinclair stand

it. The Amiga was a little better catered for, acquiring a new high-res Mitsubishi colour printer that Commodore intends to sell bundled with the Amiga for



The Spectrum Plus 2

£5,500. The company was also demonstrating an interactive video system for the machine, which it hopes will make its sales in vertical markets.

Atari launches the blitter chip

Duncan Evans tours the Atari village in search of new machines and software

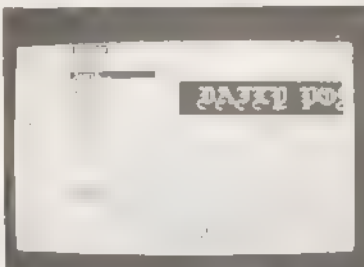
The main revelation as far as hardware from Atari was concerned was the re-packaged machine consisting of a two megabyte ST with detachable keyboard, monochrome monitor and disc drive box (see page four for more details).

Also lurking in Sam Tramiel's office were the chunky looking prototypes of a 2080STS and 4160STS, officially launched today. Another item in the pipeline is a box containing a 66020 processor running drive which will simply plug into your ST and might be available in the second quarter of 1987.

The 520 STFM, the one with the built-in disc drive and modulator, which was originally going to be released at the same time as the 520 STM but was then rescheduled for a September launch, was nowhere to be seen. However, according to Tramiel, it will be here in November, priced at or under the cost of an STM plus disc drive.

One product that was here was the blitter, the chip enables large chunks of graphics to be moved around at great speed. Atari had two machines, one with a blitter and one without, next to each other running a demo of a flock of flying birds. The machine with the blitter, which is of course what the Amiga possesses, produced an impressive, fast moving, more complex and very well

animated display. Rather than just a chip on its own it will be sold in a set which you can simply plug into your 520 or 1040ST. It's not available anywhere yet, although it has an initial price tag of \$150 (about £100), but should be in this country in November.



Fleet Street Editor

A contender for the desktop publishing market came from the combination of an ST, Fleet Street Editor (move on FSE elsewhere in this report) and a laser printer from Quadram called, appropriately enough, Quadlaser. This machine has 1.5 megabytes of memory, a printing speed of eight pages a minute at 300 x 300 dpi per page. Centronics and RS232C interfaces and a price of around £5000.

It's a really impressive hardware

peripheral you're after, then K-Max from Kuma Computers should fit the bill. K-Max consists of a box which is connected to the cartridge port of an ST, containing an interface board, dual processor board with two Immos T414 transputers and two blocks of 256k Ram. Each T414 is a 7.5 million instructions per second, 32 bit Risc (Reduced Instruction Set Computer) parallel processor. The price range kicks off at £1450.

Haba Systems had a video digitiser, from the German company Print Technik, on display which enabled you to digitise pictures from a camera or video recorder. Watching the thing being demonstrated, it only took around four seconds for a screen picture to appear once the video camera was rolling. The camera is simply plugged into the digitiser, itself plugged into the ST via the Centronics interface, and then the special software is run. The cost of this device, soon to be reviewed in *Popular*, is £249.95.

On the games front Eidersoft Software launched the most titles at one go for the ST, and all but one of them were finished. ST Karate featured digitised sound (which was inaudible because of the noise coming from the other games), single and two player option, multiple

continued on page 26



◀ continued from page 25

graphics and some very good scenery backgrounds.

ST Protector was a *Defender* style game with a mountainous skyline (as opposed to the normal line drawing) but can hardly be said to be wonderfully exciting.

Space Station looked okay even if it did resemble a poor rendition of *V* on the 64c. *Fire Blaster* was basically a shoot the things coming down from the top of the screen game and then there was a platform game with very small, colourful, graphics.

The prices ranged from £24.95 to £29.95 which was a bit on the high side even if there aren't any plain shoot 'em ups on the ST yet.

The most impressive games came from *Psygnosis*, authors of *Brattacas*. *Deep Space* had some excellent graphic scenes, namely one featuring a close up of a "Death Star", seemed to be very much in the *Star Raiders* department. I say seemed because the game kept crashing early on when someone tried to give me a demonstration. He assured me it would work in the end and would cost £34.95.

The other product from the Liverpool lads was *Arena*, a sporting events game, which had *Brattacas* sized character graphics set against a stadium type backdrop. Eight events were on offer, including running, javelin and shot put.

Once an event is started and you don't start beating the hell out of the keyboard speech bubbles appear from your athlete requesting, amongst many other things, that someone wake you up. If you perform something fairly badly, then another character appears on screen and, well, takes the mickey is the polite expression. Costing a modest (in ST terms) £29.95, *Arena* is one to look out for.

Microdeal had various pieces of new software on display, most of which, they reluctantly admitted weren't finished



ST Protector

yet. Among these were *Electronic Pool*, not graphically brilliant but seemed realistic in play, and *Pinball*.

Pinball has the facility to design and colour your own pinball table. Graphically speaking, the best thing from *Microdeal* was *Karate Kid 2*. Unfortunately the

game hasn't been written yet and all they had on display were some very good pictures which will be in it. The game should follow the basic plot of the film rather than just being of the hack, chop, next variety. The release is tenuously scheduled for release in November.

Mirrorsoft also announced *Strike Force Harrier* and *The Bermuda Project*.

The eight-bit Atari's were represented in the Atari village, but only just. *Red Rat Software* had on display the *Panic Express* (disc £5.95 tape £3.95), *Screaming Wings* (£9.95/£7.95) and *A Day at the Races* (£9.95/£7.95). Announced were *Freaky Factory*, *Rocket Repairman*, *War Copter*, *Astro Droid*, *Demolition Derby*, *Treasure Island*, *Dragon's Breath*, *Dominion of the Undead* and *Escape from Planet X*.

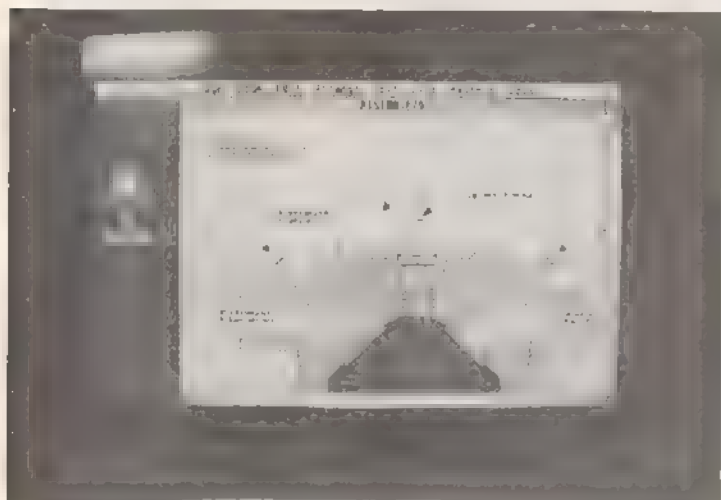
Red Rat also intends to convert *Screaming Wings* to the ST to retail at £19.95.

Finally on the games front, Atari had some of its prehistoric games consoles, the 2600's, over in one corner, happily running cartridges from a large collection.

GST, authors of *1st Word*, bundled with the ST at the moment, were showing the follow up, imaginatively called *1st Word Plus*. This version kept the same basic style as its predecessor but incorporated a number of new features including a spelling checker. The most interesting feature, beyond the merely



Arena and *Deep Space* for the Atari ST



for £39.95 and a *Fractal Generator* costing £19.95.

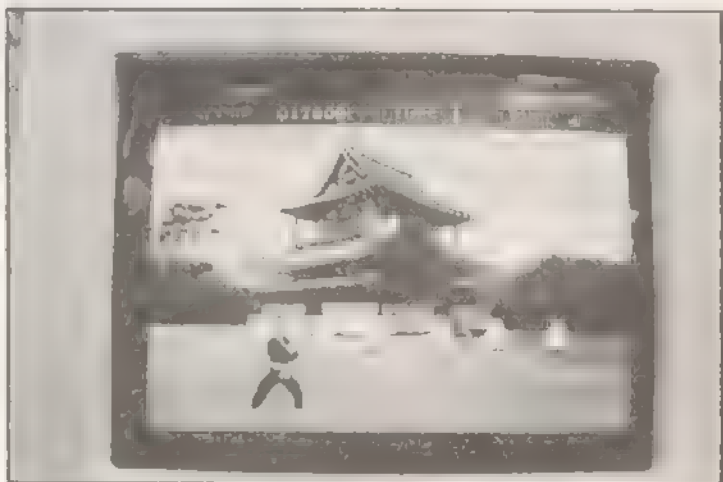
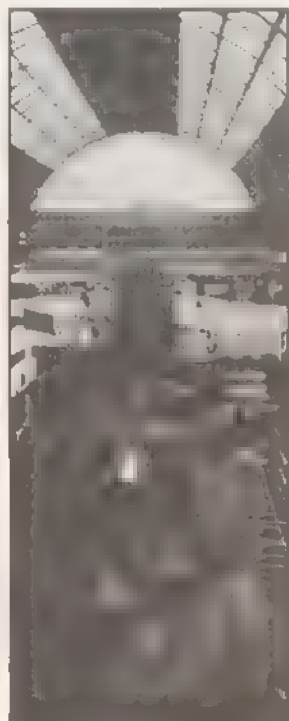
Cashlink Software was displaying *Cashlink ST Accounts* which claimed to be a complete accounts department. It handles all credit accounts with full accounting ledgers and maintains records for your stocks using stock control. This comprehensive accounts package would set you back £295 (plus VAT).

For those interested in other languages **Prospero Software** was showing its Fortran-77 and Pascal compilers. The Fortran-77 was a full Ansi X3.9-1978 Fortran compiler for the ST featuring 7 and 16 digit precision floating point, four byte integers and full Gem AES and VDI bindings.

Pro Pascal is a complete Ansi 770X3.97 Standard Pascal compiler with the same sort of features found in the Fortran compiler. Both programs cost £129 (plus VAT).

cosmetic additions, was the facility to allow graphics from any Gem application to be included in the document. There is an accessory which comes with the program called *Snapshot* which 'snaps' a picture of any Gem program and stores the screen in a GST packed format. Once saved the picture can then be loaded and incorporated into any document.

Also from the GST stable were *1st Mail*, a mail merge program for £29.95, *C Compiler* for £59.95, *Macro Assembler*



ST Karate



ST Karate

Marbles, madness and Scooby Doo

John Cook with the fun and games part of the show

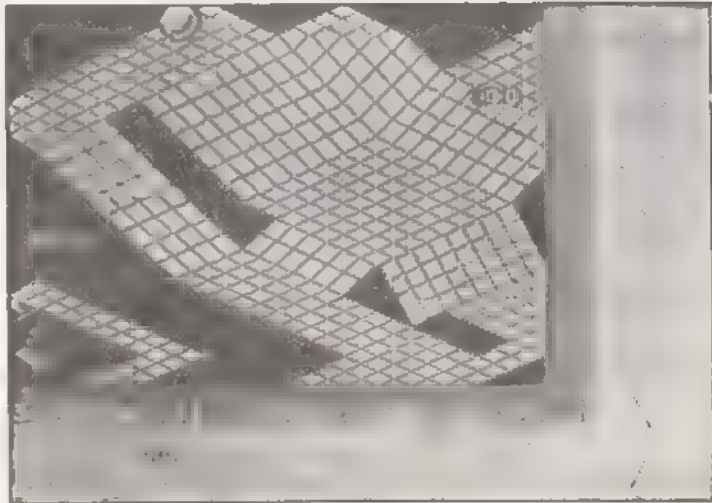
The first day of PCW – the TV personalities, the glitter, the razzamatazz, the hum of business deals being closed, the shouts of the workmen nailing together unfinished stands, the burst of white noise as pre-production programs crash spectacularly.

This is the stuff shows are made of and this year was no exception. The big trend (as far as games software goes) was, of course, coin-op conversions – even **The Edge** is getting in on the act with *Shao-Lin's Road*, from Konami, which was the follow-up to the game made successful on home micros by **Imagine**, *Yie Ar Kung Fu*. "We want to prove we can do coin-op conversions as well as anyone," said Tim Langdell, "better even!"

Such bullish optimism was a hallmark of most exhibitors: "Things are looking up," was the consensus. Certainly a change from the gloom and despondency displayed at some points last year. So what did you miss, if you weren't there?

Activision – while vying for the hotly contested prize for "Most Impenetrable Press Release of PCW 1986" – had a wide range of software under its own name and under the increasing number of associated labels, the newest of which is **Advents**.

This is a label dedicated to the production of graphic/text adventures, the first of which is *Chicago*. In this one you play the part of Rats Muldano – recently released from gaol. What makes this effort particularly noteworthy is the fact that it was written by **The Ram Jam Corporation** using its custom designed adventure writing system, *The Bird*. The warped mind of Ram Jam mastermind



Marble Construction Set from Melbourne House

George Stone will ensure that this is going to be one to watch out for. Available on Spectrum, C64, Amstrad CPC, Amstrad PCW and Atari ST soon.

Loricels had its newest, *Bactron*. This is a 3D perspective job on the Amstrad CPC that has you fighting to keep yourself healthy while you're being attacked by sundry bacteria and viruses. The ideal program for hypochondriacs. Out later on in the month.

Hacker II was impressive. With several video displays functioning on screen at once, this one looks good. Out on all major formats soon.

Howard the Duck was in evidence on

the 64, being based on the film which was based on the comic book and was using his unique "quack-fu" skills to battle his way through a treacherous volcanic island.

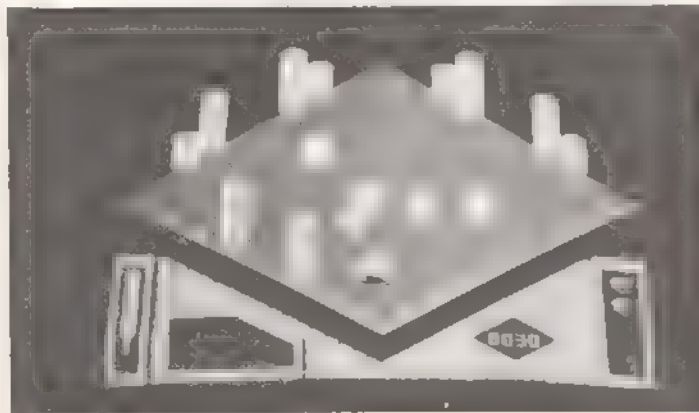
Wackier still, try *Tass Times in Tontown* as an experiment in alternative reality adventuring. Utterly weird disc based entertainment on CBM 64, Apple II, PC, Mac, Amiga and ST.

What has David Crane been doing since *Little Computer People*? *Transformers* is the answer – the game of the toy. One of a number of toy/comic spin-offs this year, it's out for Commodore owners in October.

Sports simulation were glued to the **Gamestar** section – with the unveiling of three new programs from the US: *Championship Golf*, *Championship Basketball* and *Championship Baseball*, while **System 3** fans were glued to the wall – reading the promotional posters for *The Last Ninja*, *Bangkok Knights* and *Domination*. The lack of any working demos suggests that the "available shortly" tag should be interpreted as "don't hold your breath."

The battle of the robots could be coming up on your computer soon – Activision's *Transformers* vs **Ariolasoft's** *Gobots*. Although Ariola might be behind in the programming stakes (the licensing deal was only very recently signed) it did have the advantage of having a fully functioning robot actually present on their stand.

Other highlights of the stand included hands-on demos of the flagship of the



Bactron, courtesy of Activision/Loricels

new Reaktor label, *Deactivators*, and, at last, *Marble Madness* on the 64.

With the launch of the Amstrad PC - Ariola also had *Pinball Construction*, *Music Construction*, and *Seven Cities of Gold* for the beast. Queue here.

Alligata was strategically placed near the lower ground floor bar - allowing persons to stagger out and try their hand at *Pub Games*, on the Spectrum, C64 and Amstrad machines, with darts, skittles, bar billiards, table football, dominoes, pontoon and poker to choose from. Announcements included the next Tony Crowther game on Commodore, *Kettle* (is the lad going mad we ask ourselves?) and a two game package for the PCW 8256/8512, *Guardian* and *Blogger*. Full reviews appearing here very soon! Alligata is also claiming ■ first - chess on MSX ■ the shape of *Cyrus II* (also on Spectrum). Unless you know differently, of course.

Anco was displaying a wide selection of games - but the monitor that was being given the closest inspection was *Strip Poker* on the Atari ST. Described as "sizzling entertainment" - Anco precariously avoids the charge of sexism by making available data discs containing extra opponents, both male and female. The question of the program's naifness, however, is never in doubt.

Addictive was headlining with *Head-coach* on Spectrum, but anyone that saw



the *Kirel* CPC conversion cannot fail to have been impressed. Out soon - so Amstrad arcade/puzzle addicts, start saving.

Interesting things you can do with your Spectrum number 1097 - use it to help you pass your driving test. The program of the same name, (a Supersoft release, but on the **Audiogenic** stand takes you through 40 lessons, with graphics, giving you driving tips and asking you questions. Based on an existing best selling book, it's not as crazy as it sounds.

On the **Beyond** stand, the organised crowds of Trekkies running over to the left, then the right, then throwing themselves on the ground, failed to appear. Shame, but early video demos of the game were present - looking very nice indeed. Other Beyond games were on display, such as *Dante's Inferno* from Denton and the new *Best of Beyond* compilations.



The cheerful chappies from **CDS** were keeping a lowish profile; but had *Colossus Bridge* on display for CPCs plus plenty of existing software to play hands-on... which cannot be said of **CRL**. An impressive bank of 20 video screens - and that's it. It was OK for people "■ the know" - who were ushered into the CRL inner sanctum for VIP treatment, but what about everybody else?

"If Batman was the death of the idea that you couldn't write arcade games for the Joyce, then this must be the equivalent of jumping up and down on the grave"

Displayed on the screens (carefully placed at neck straining height, so it seemed - probably for the same reason you don't get comfy chairs at Macdonalds) was, amongst other things, *Cyborg*, and CRL's *3-D Game Maker*, which allows you to create your own *Knight Lore* type games.

Not much hands-on stuff at the **Durell** stand either, but certainly the promise of some excellent new releases, most impressive of which was *Thanatos*.

Programmed by Mike Richardson (author of *Combat Lynx*, *Turbo Esprit*, et al) the central character you control in this game is a giant dragon. The animation of this main sprite is stunning, and if the rest of the program is up to the demo, Spectrum owners should be queuing up to buy this one at the end of the month.

Also announced at the show, a Durell compilation *The Big 4* - *Combat Lynx*, *Critical Mass*, *Turbo Esprit* and *Saboteur* on Spectrum, CBM 64 and Amstrad CPC

- all formats £9.95

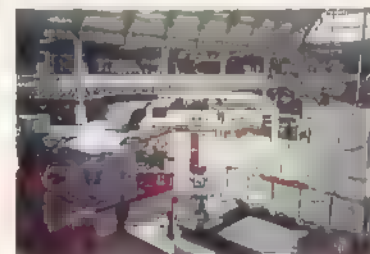
Digital Integration has taken two years to write *TT Racer* - and the finished product was there on Spectrum, together with hunky Suzuki racing bike. Just as good and twice as unexpected, *Tomahawk* was up and running the Amstrad PCW. If *Batman* was the death of the idea that you couldn't write arcade games for the Joyce, then this must be the equivalent of jumping up and down on the grave

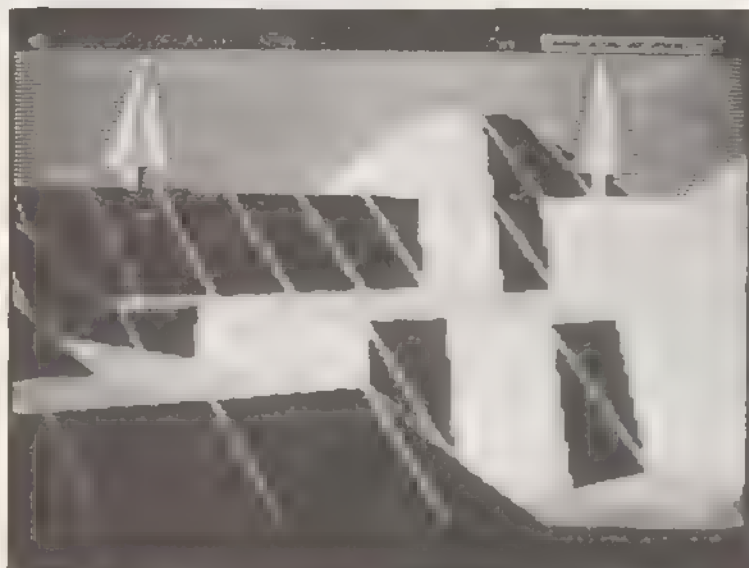
Domark officially released *Trivial Pursuit* - the computer game - and with *Young Player*, *Baby Boomer* and *Genus II* questions planned, this one will run and run. Watch out for their game based on the next James Bond film, due for release next Spring. And when we say "watch out!"

Eyes were on the few screens available for *Fairlight II* subtitled *A Trail of Darkness*, from **The Edge**. Specifically written with the Spectrum 128/Plus 2 in mind (although there is a multi-load 48K version), improved graphics and outdoor locations have been promised.

Colourful 3-D was in evidence on the Amstrad CPC in the shape of *Palitron* - written by ex-Virgin programmer Charles Goodwin.

Equal first (with Gauntlet on the US Gold stand) for the most queued-up-at-





Sentinel

to-play coin-op was *Space Harrier* – supplied by Elite. Not much sign of the game yet, but the hydraulically operated stand-alone was a massive hit.

Available to play – *Scooby Doo, 1941*, and Commodore *Paperboy*, all up to the usual standard.

Electric Dreams has a massive white pyramid dominating their stand – what some executives will do to save buying a new packet of razor blades. Bags of new stuff though. Two licences to produce conversions of the old Atari classics, *Tempest* and *Star Raiders II* and an amazing looking "Gauntlet" type game, *Dauntless*, to name but two – and news of two film tie-ins, *Big Trouble in Little China* and *Aliens II*.

Firebird were out in force, with first public viewings of megagames to be, *Cholo* and *Sentinel* – both out first on BBC. *Druid* made quite an impression (another game in the "Gauntlet" mold) and head and shoulders above the other Silver releases, *Gyran Arena II* you never bought the original – try this cut down version. It's great!

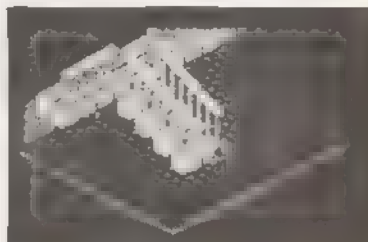
Sharing the stand were **Odin**, with many of their newest releases, including the stylish *Heartland*, and a demo of a new autumn release, *Hyperball*.

Gremlin were well represented, the most interesting program being a Bouncer derivative, *Trailblazer*. It's another, "bounce on the squares or fall off" job, granted, but from a different perspective – the 64 version has a great two player simultaneous race version.

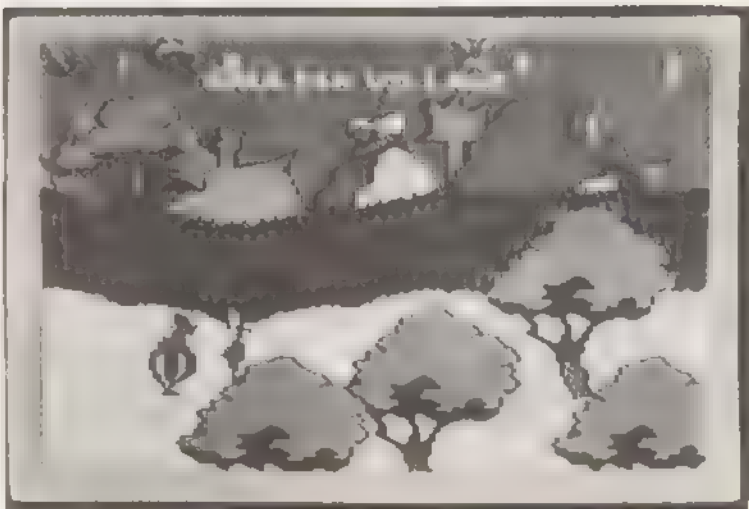
Glum faces at the **Mikro-Gen** stand, as the PCW Show organisers decided that it was too dangerous to have members of the SAS hanging round the stand, promoting the yet to be released, *SAS Strike Force*. The appearance of teenage pash *Ricky Steel*, complete with



Rogue Trooper



Nosferatu



Asterix

prosthesis, was little compensation it seems – or did it have something to do with the fact that Brian Jacks was on the **Martech** stand, promoting *Uchi-Mata*?

The organisers did, however, allow Mikro-Gen to release *Frostbyte* on Amstrad CPC, an arcade adventure featuring a liquorice allsort as the main character. Identify with that, kids.

After a relatively silent summer, a flurry of activity from **Melbourne House**, with *Fist II* taking the starring role, closely followed up by *Asterix* and the *Magic Cauldron* amongst others. Far from being just a load of old Gauls, the game genuinely seemed to capture the spirit of those excellent comic books – well worth looking out for. As for *Marble Madness Construction*... take me to it.

Pride of place was given to the Mag-

num joystick on the **Mastertronic** stand, with games taking a second place to the strangely shaped beast as it perched resplendent beneath the perspex. The less awe struck, however, would have *Flash Gordon* – coming to your Commodore soon.

Mirrorsoft was out in force with a number of recent and future releases on display. With *Icon Jon*, it asks the philosophically daunting question, "What happens to a program when the computer gets turned off?"

As a program trapped inside a computer due to shut down in thirty minutes, you must scurry around collecting and manipulating objects – all under Icon control of course. A nice looking game on Amstrad CPC – out soon. Other thought provoking masterpieces are

rumoured to include a title in which you must stack as many angels as possible on the head of a pin.

With **Novagen**, the *Mercenary* machine rolls on with an excellent SI version being launched at the show, an Amstrad CPC version due out in October and a Spectrum conversion out by Christmas. Trivia collectors will be pleased to learn there are now a total of 15 different machine/language *Mercenary*'s. As for *Mercenary II* - expect that mid '87 - as Novagen's Tim Boshier says, "*Mercenary I* is a hard act to follow."

On the **Ocean/Imagine** stand, the sharp eyed could spot the one we've all been waiting, and waiting, and waiting, and waiting for. *Street Hawk* was seen up and running on Amstrad - and looked very impressive to boot.

Good news for C16/Plus 4 owners - versions of *Rambo*, *Green Beret* and *Hyper Sports* are on the way.

If only Eddie Waring were here to see it - that game without frontiers, *It's a Knockout* has finally reached the home computer (Commodore 64 and Atari only).

No Spectrum version, which is a pity as a decent attribute clash would have perfectly replicated Stuart Hall's usual shirt/tie combination.

Palace Software releases are few and far between, but they tend to be good. Demos at the show this year was their next release *The Sacred Armour of Antihed*. The plot comes straight out of pulp comic fiction, which isn't surprising, since a comic artist, Dan Malone designed it. Set in a post-holocaust world where the primitive survivors have been enslaved by an alien race (never rains but it pours, eh?).

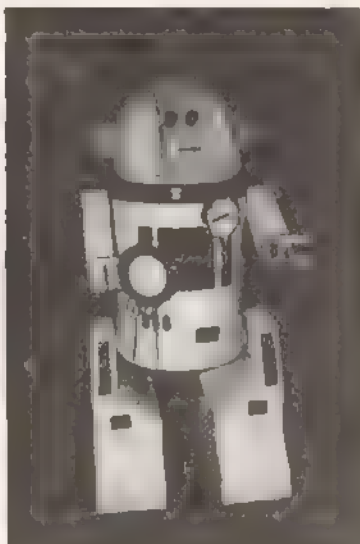
Your quest, as Tal, is to find the Sacred Armour and defeat them single handed. This is the stuff arcade adventures are made of. On Commodore 64 and Spectrum in October, Amstrad CPC by Christmas.

Piranha had plenty of bite on its stand - a tankful of them in fact, complete with bones stripped clean of flesh by the little beasties. The latest release *Trap Door* was in evidence (play the game, eat the record) - and on preview was *Rogue Trooper* and a few beautifully detailed screens from *Nasferatu*.

Rainbird had a good show, with pride of place being taken by *Starglider* running on the ST. Although not quite finished yet, an advanced demo was up and running and performing very well indeed. Vector graphics space games will never be the same again.

Other highlights: *Tracker*, billed as an arcade/strategy wargame - and a game that seems to have been hanging around for ages one way and another - now on Commodore 64 - *The Pawn*.

US Gold have kept the video makers busy this summer - but not a hands-on home micro game to be seen. While



these promotional devices certainly have great advantages for the exhibitor - videos of pre-production games have never been known to crash for example - there were one or two murmurs of discontent on this and, to be fair, other stands, where you couldn't get your hands on a working game.

Never-the-less, US Gold has a lot of good stuff coming out this autumn, with the highlights being *Gauntlet* (on Spectrum, CBM 64, Amstrad CPC, Atan, ST, PC and Amiga), *Super Cycle* (motor racing from the guys that brought you *Pole Position*, Epyx) and *AcroJet* - what looks

like an astounding flight simulator by Microprose.

The first **US Gold/Vortex** tie-up has produced *Revolution*, a game which looks as challenging and stylish as that previous Vortex hit, *Highway Encounter*. Another complex arcade puzzle with some great 3D perspective effects.

Top photo: At the PCW show

Photo left: Mastertronic's macho Magnum joystick

Photo right: Danby, Ariolasoft's promotional robot

Infinite variety on the 8256

Christina Erskine leaves the crowds round the Amstrad PC to view the new PCW 8256/8512 products

If the first public showing of Amstrad's PC range drew some attention away from the now well-established PCW machines, it made no difference to the third party companies.

The sheer variety of software and add-ons being developed and launched far exceeds the expectations of a year ago, when the 8256 "word processor" was unveiled.

Graphics? No problem. Take your pick from a light pen, mice, a forthcoming graph pad, or Mirrorsoft's ambitious graphic operating system, all of which were being publicised at the show.

Electric Studio's light pen (for a full review, see *Popular Supplement*, September 4) plugs directly into the PCW's expansion port, and comes complete with *Art*, a graphics software package. With *Art* and the pen, most standard graphics features are supported: pencil, spray can, multi-brush and fill effects, plus a variety of polygons, and various copying, moving of pictures, etc., options. A GSX driver is included to enable the pen to be used with *DR Draw*.

Art is also supplied with the mouse package, and adds facilities to expand and contract screen areas, and a horizontal and vertical lock for the mouse.

Curiously, Electric Studio is also providing a joystick slot on the mouse interface, and a joystick driver program on each disc. Just in case the mouse doesn't win you over, I suppose.

The *Art* software is being pressed to various uses. Forthcoming Electric Studio products include a PCW video digitiser, and a font module, both of which are compatible with and expected to be used with the *Art* package.

The light pen costs £79.95, the mouse pack £129.95. Electric Studio can be contacted at Unit 13, The Business Centre, Avenue One, Letchworth, Herts.

Another PCW mouse comes from Kempston. While the mouse itself has been around for some time, Kempston launched the PCW interface at the show. It's early days yet for details of the software, but the package is set to cost £79.95. AMX is also planning a version of its mouse and interface for the PCW 8256/8512.

The graph pad mentioned above was on display courtesy of Grafsales. Together with the company's G3 software, Grafpad 3 offers a professional CAD system. The pad features include line drawing, rectangles, circles, arcs, zooming and panning, rotation and tilt. Special defining symbols can be created and saved. Hard copy, obviously, can be dumped to the PCW printer, but addi-

tional driver routines must be bought for plotters.

Grafsales is also making this product available for the Commodore 64, and hoping to link it with Geos. Grafpad 3 is also ready for the PC1512 (and thus other IBM compatibles), the CPC range, and the BBC Master series.

Mirrorsoft's *Graphics Operating System* is still very much in the embryonic stage, but when released, will provide programmers with a set of graphic tools on disc. Features include all the usuals, plus character drawing to any screen pixel, ellipses, windowing and rotation.

Mirrorsoft was also showing a demonstration of *Fleet Street Publisher* on the PCW machines.

This is *Fleet Street Editor* but an echelon higher, in that more sophisticated newsletters can be written - to the extent that the *Fleet Street* series can begin to approach a typesetting machine level. See elsewhere in this report for more on *FSE*.

More details on Mirrorsoft's products can be obtained from the company at Maxwell House, Worship Street, London EC2.

Publishing type programs are much in vogue at the moment, with several font packages - to enable print-out in a variety of different typefaces - being exhibited.

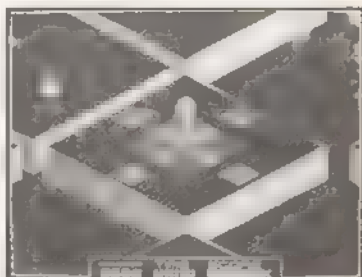
One such is Gemini's *Fontgem*, which gives a choice of eight different printing styles, and avoids the all too usual pitfall of offering typefaces which have a novelty value only, and are generally illegible.

But the main asset of *Fontgem* is that it is compatible with both *Lacoscript* and CP/M programs.

Also new from Gemini is *Taxgem*, a "beat the Inland Revenue to it" program. *Taxgem* enables you to work out your tax liability for the year, a depressing occupation that I doubt is made any happier by doing it faster than on the back of an envelope.

Both Gemini products are £19.95. Gemini is at Gemini House, Concorde Road, Exmouth EX8 4RS.

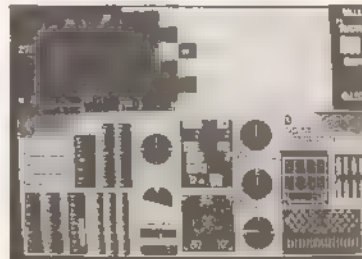
The flurry of games being released on the machine about two months back (*Batman*, *Graham Gooch's Test Cricket*, *Fairlight*, etc) seems to have abated somewhat, but Interceptor is converting its latest adventure *Aftershock* (anyone know what to do with the ceiling panel right at the beginning?), and Digital Integration has put its helicopter simulation, *Tomahawk*, on to the machine. *Aftershock* will cost £17.95, *Tomahawk* £19.95.



Top: Vortex's *Revolution*, see page 31

Above: Piranha Software's stand representatives take a break

Below: More PCW games DI's *Tomahawk*



Read all about it

Mirrorsoft's Fleet Street Editor programs appeared on no less than three show stands. Christina Erskine finds out why

Mirrorsoft's plans for its Fleet Street Editor series were taking a solid shape at the show. The BBC version, released earlier this year, was very much a "print your own club newsletter with help from some of the stored graphics" affair. Fleet Streets demonstrated for the PCW 8256/8512, Atari ST and IBM PC compatibles (thus including you-know-what) use the more powerful features of the machines to their best effect.

The series will include two "labels": Fleet Street Editors and Fleet Street Publishers.

Put simply, Editors specifically cater for one page news-sheets, while Publishers cater for multiple page numbering. Some of the machines will have both Editor and Publisher versions.

On display last week was a scrolling demo of PCW FS Publisher, still in embryonic stages, a very nearly finished ST Publisher and a finished IBM Publisher plus laser printer.

When released the ST version should be a very professional package. Within

its text output options include facilities for point sizes to the nearest quarter, measurements in millimetres, inches or ems, half tones, eight different fonts, plus a font designer, a hyphenation dictionary and kerning (a thoroughly complicated process dealing with the spacing between individual characters). It will also have facilities for freehand graphic drawings for its illustrations, and sizing and scaling for those graphics.

For the ST, three versions are planned: an Editor, a Publisher which can be linked to a laser printer, and a Publisher which can become a typesetting workstation.

The PCW version is being developed go a very highly sophisticated specification, with features similar to that of the ST version. At present, however, its output is necessarily geared to the PCW's printer. Again, more than one version is planned: an Editor, and a Publisher. For Amstrad CPC owners, a Fleet Street Editor is planned.

The point of all this is to build up the range so that it can be used by not only individuals with club newsletters, etc.,

Created with - Fleet Street Editor / PC

October 56

NEWS

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Our Men To Watch

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from **RIARONSOFT**

but also professionally as liaison with typesetters, and to sell to hardware manufacturers on an OEM (Original Equipment Manufacturer) basis

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Furniture

by Richard and Jackie Gain

If you ever get the urge to move the furniture around to give a room a new look it can take hours trying out the various combinations, not to mention the effort involved. This program will hopefully solve these problems.

Start by typing in the program and saving it with *Goto 9000* if you have microdrives or *Goto 9100* if not.

Now, run the program, select option

one and enter details of the room(s) by following the instructions on screen.

Next it's the turn of the furniture, and these are represented as rectangles for simplicity.

Once the initial preparations are completed selecting option three allows you to move the furniture around to your heart's content. Use 'N' for the next item until you arrive at the desired piece then use 'S' to select that item. You now have the choice of '5/6/7/8' for moving the

item and '9' to rotate through 90 degrees.

'S' changes the step size used when something is moved and finally 'O' fixes an item at its present location. Another menu will now appear and pressing 'C' will send the display to the printer. 'N' will allow you to move the next piece of furniture while 'F' returns you to the main menu.

The second part of the listing will be given next week.

```

100 REM 00655-9: REM CASE ON
110 DIM S(40,4)
120 DIM F(40,4)
130 LET FC=0: LET S=0
140 DIM S(40,4)
1500 REM MEN
1610 CLS : PRINT AT 0,10:"FURNITURE"
1620 PRINT AT 0,4:": DESIGN ROOM"
1630 PRINT AT 0,4:": DESIGN FURNITURE"
1640 PRINT AT 0,4:": MOVE FURNITURE"
1650 PRINT AT 0,4:": SAVE ROOM DATA"
1660 PRINT AT 0,4:": LOAD ROOM DATA"
1670 PRINT AT 0,4:": SELECT NOW:"
1700 LET I$=INKEY$: IF I$="" THEN GO TO 1700
1800 IF I$="1" OR I$="5" THEN GO TO 1700
1900 GO TO 1000:OPTIONAL I$
2000 REM DESIGN ROOM
2100 CLS
2200 PRINT "AT 0,10: BEGIN AT TOP LEFT"
2300 PRINT "AT 0,10: PAUSE 100"
2400 LET S=0
2500 PRINT "AT 0,10: PRESS 5/6/7/8 & F"
2600 PRINT "AT 0,10: OF NEXT WILL - 0 TO F"
2700
2800 LET I$=INKEY$: IF I$="" THEN GO TO 2800
2900

```

```

3000 IF I$="5" THEN LET S=S+1: GO TO 1700
3100 IF I$="6" OR I$="7" THEN GO TO 2000
3200 IF I$="8" THEN LET Y=Y+1: LET X=X
3300 IF I$="9" THEN LET Y=Y: LET X=X+1
3400 IF I$="0" THEN LET Y=Y: LET X=X
3500 IF I$="F" THEN LET Y=Y: LET X=X
3600 INPUT "ENTER WIDE LENGTH: YAK 20.00"
3700 LET W=INT(WIDE LENGTH)
3800 LET H=INT(H)
3900 LET X=X+1: LET Y=Y+1
4000 LET X=X+1: LET Y=Y+1
4100 LET X=X+1: LET Y=Y+1
4200 LET X=X+1: LET Y=Y+1
4300 LET X=X+1: LET Y=Y+1
4400 LET X=X+1: LET Y=Y+1
4500 LET X=X+1: LET Y=Y+1
4600 LET X=X+1: LET Y=Y+1
4700 LET X=X+1: LET Y=Y+1
4800 LET X=X+1: LET Y=Y+1
4900 LET X=X+1: LET Y=Y+1
5000 REM 00656-9: REM CASE ON
5100 CLS : PRINT AT 0,10:
5200 REM MEN
5300 CLS
5400 PRINT "AT 0,10: BEGIN AT TOP LEFT"
5500 PRINT "AT 0,10: PAUSE 100"
5600 LET S=0
5700 PRINT "AT 0,10: PRESS 5/6/7/8 & F"
5800 PRINT "AT 0,10: OF NEXT WILL - 0 TO F"
5900
6000 LET I$=INKEY$: IF I$="" THEN GO TO 6000
6100

```

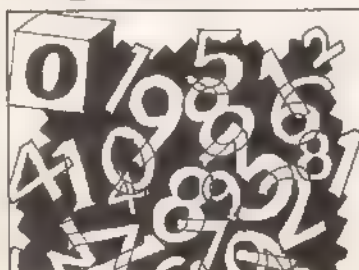
```

6200 REM DESIGN FURNITURE
6300 CLS : LET FC=FC+1
6400 INPUT "ENTER SIDE 1 LENGTH (INCHES)"
6500
6600 INPUT "ENTER SIDE 2 LENGTH (INCHES)"
6700
6800 LET FC=FC+1
6900 LET FC=FC+1
7000 INPUT "ENTER NAME OF FURNITURE"
7100
7200 PRINT "AT 0,10: PRESS 1 FOR MORE"
7300
7400 IF INKEY$="" THEN GO TO 3010
7500 IF INKEY$="0" THEN GO TO 1000
7600 GO TO 3000
7700 REM SELECT FURNITURE
7800 GO SUB 2500: LET STEP=1: LET FC=1
7900 PRINT "AT 0,10: PRESS N FOR NEXT 0"
8000
8100 IF INKEY$="" THEN GO TO 4030
8200 IF INKEY$="N" THEN GO TO 4030
8300 LET FC=FC+1: IF FC=FC THEN GO TO 4040
8400
8500 IF I$="N" THEN GO TO 4100
8600 IF I$="N" THEN GO TO 4020
8700 LET FC=FC+1: IF FC=FC THEN LET FC=1
8800

```

Programming: C128

Bigtext



by Steve Dunn

This small utility program allows text of any width or height to be printed to a hi-res and multicolour screen. The text can also be highlighted, printed upside down, left to right and textured.

To use this program it must be entered as a subroutine at the end of your own programs and called with a *Gosub*, after setting up certain variables as follows.

XP and YP are the starting co-ordinates of the text.

W and L are the width and length of the

text and have values of 1-100.

With the following variables a value of zero cancels and a value of one sets, a feature.

RUF gives textured print.

IV gives highlight print.

UD gives upside down print.

LR gives left to right print.

LC gives lower case letters.

After the variables have been set you must select a graphics mode and *Gosub* the line number where you have placed the utility.

In the listing lines 30 to 280 are a demo only.


```

30 GRAPHIC 1:1 REM ** GRAPHIC MODE **
40 LP=0 VP=0 REM ** X & Y CO-ORDINATES **
50 L=0 UD=0 REM ** LEFT TO RIGHT * UPSIDE DOWN CANCELED **
60 L=2 W=2 REM ** LENGTH AND WIDTH **
70 IV=0 REM ** INVERTED OFF **
80 A$="BIGTEXT IN STEVE.D" REM ** TEXT TO BE PRINTED **
90 GOSUB 1000 REM ** EXECUTE BIGTEXT PROGRAM **
100
110 IV=1 REM ** INVERTED ON **
120 XP=100 YP=100 REM ** X & Y CO-ORDS **
130 A$="INVERTED" REM ** TEXT **
140 GOSUB 1000
150 IV=0 LP=1
160 A$="LEFT TO RIGHT"
170 W=1 L=1
175 XP=0 YP=100
180 GOSUB 1000
190 LP=0 UD=1
200 A$="UPSIDE DOWN"
210 XP=150 YP=100
220 GOSUB 1000
230 XP=150 YP=120
240 UD=0 LC=1
250 A$="LOWER CASE"
260 GOSUB 1000

```

```

278 LC=1
280 END
1000 FOR I=1 TO LENGTH: LC=ASC(MID$(M$,I)):
1010 IF CC2=64 AND LC=0 THEN BASE=DEL:DOUBT=V=64
1020 IF CC2=224 AND V=65 THEN BASE=DEL:DOUBT=V=62
1030 IF CC2=156 AND LC=1 THEN BASE=DEL:DOUBT=V=160
1040 IF CC2=134 AND LC=223 THEN BASE=DEL:DOUBT=V=192
1050 IF V=1 THEN BASE=BASE+DEL:DOUBT=
1060 IF LC=1 THEN BASE=BASE+DEL:DOUBT=
1070 FOR I=14 TO 15: CC2=INT(CC2-V)/BASE:BASE=
1080 FOR I=0 TO 7: V=X-PEEL:MEM(I)=PEEL
1090 FOR I=0 TO 7: CHANGE=C5:IF I=1 THEN FORV=10: ELSE
1100 V=10: IF I=0 THEN I=1
1110 FOR I=0 TO 7: IF I=0 THEN I=1: MEM(I)=V:
1120 IF I=0 THEN BASE=INT(BASE/CC2): ELSE POT=0
1130 IF I=1 THEN MEM(2)=V: MEM(3)=I: IF I=1: ELSE
1140 MEM(3)=I: MEM(4)=I
1150 FOR I=1 TO 1: I=1: *SOW: + V*W: + I*2: I=1: I=1
1160 + V*W: + I*2: POT=1
1170 FOR I=1
1180 FOR I=1
1190 FOR I=1
1200 FOR I=1

```

Mushroom Mania

by Jonathan Temple

This week features the final part of the Mushroom Mania listing. The 'Z' and 'X' keys move your spray can about whilst Return fires the spray. There are five different speeds and two skill levels. You start off with three lives and are awarded an extra one after completing the first screen.

The program will also run on the Electron if the following changes are made. Delete lines 1030-1120 and replace them with -

```

1030 FOR K%=1 TO 45+J%*15.
VDU31,RND(40)-1,RND(27)+2.224:
NEXT

```



```

1820 11A #121:ISS search
1830 11A #122:ISS search
1840 return
1850 gte
1860 goto 1
1870 11A #123:ISS search
1880 11A #123:ISS check
1890 goto 1
1900 11A #123:ISS check
1910 11A #123:ISS check
1920 11A #123
1930 check
1940 11A:ISS store:11A
1950 11A #123:ISS search
1960 11A #123:ISS search
1970 11A #123:ISS search
1980 11A #123:ISS search
1990 11A #123:ISS search
2000 11A #123:ISS search
2010 11A #123:ISS search
2020 11A #123:ISS search

```

[illegible]

```

1:  *CWR#(11111)
2000 IF sound=99 THEN *R=100.1
2040 IF sound=99 THEN *R=100.5
2050 PRINT#48 10.100,"Speed 1-5"
2060 *R=10.100/100.000*1000
2070 PRINT#48 10.100,"*R="; *R; " (0-8)"
2080 *R=10.100/22.50/32.00*1000
2090 *R=0
2100 IF 5.40 IF 5.52 1000-40
2110 IF 5.65 IF 5.66 1000-60
2120 IF 5.70 OR 5.80 sound=9
2200 *N=L: *R=0
2340 ENDPROC
2350 DATA 1.0,1.1,1.2,1.3,1.4,1.5
2370 DATA 1.6,1.7,1.8,1.9,2.0
2390 DATA 2.1,2.2,2.3,2.4,2.5,2.6,2.7,2.8,2.9,3.0
2410 DATA 3.1,3.2,3.3,3.4,3.5,3.6,3.7,3.8,3.9,4.0
2430 DATA 4.1,4.2,4.3,4.4,4.5,4.6,4.7,4.8,4.9,5.0
2450 DATA 5.1,5.2,5.3,5.4,5.5,5.6,5.7,5.8,5.9,6.0
2470 DATA 6.1,6.2,6.3,6.4,6.5,6.6,6.7,6.8,6.9,7.0
2490 DATA 7.1,7.2,7.3,7.4,7.5,7.6,7.7,7.8,7.9,8.0
2510 DATA 8.1,8.2,8.3,8.4,8.5,8.6,8.7,8.8,8.9,9.0
2530 DATA 9.1,9.2,9.3,9.4,9.5,9.6,9.7,9.8,9.9,100
2550 DATA 100.1,100.2,100.3,100.4,100.5,100.6,100.7,100.8,100.9,101
2570 DATA 101.1,101.2,101.3,101.4,101.5,101.6,101.7,101.8,101.9,102
2590 DATA 102.1,102.2,102.3,102.4,102.5,102.6,102.7,102.8,102.9,103
2610 DATA 103.1,103.2,103.3,103.4,103.5,103.6,103.7,103.8,103.9,104
2630 DATA 104.1,104.2,104.3,104.4,104.5,104.6,104.7,104.8,104.9,105
2650 DATA 105.1,105.2,105.3,105.4,105.5,105.6,105.7,105.8,105.9,106
2670 DATA 106.1,106.2,106.3,106.4,106.5,106.6,106.7,106.8,106.9,107
2690 DATA 107.1,107.2,107.3,107.4,107.5,107.6,107.7,107.8,107.9,108
2710 DATA 108.1,108.2,108.3,108.4,108.5,108.6,108.7,108.8,108.9,109
2730 DATA 109.1,109.2,109.3,109.4,109.5,109.6,109.7,109.8,109.9,110
2750 DATA 110.1,110.2,110.3,110.4,110.5,110.6,110.7,110.8,110.9,111
2770 DATA 111.1,111.2,111.3,111.4,111.5,111.6,111.7,111.8,111.9,112
2790 DATA 112.1,112.2,112.3,112.4,112.5,112.6,112.7,112.8,112.9,113
2810 DATA 113.1,113.2,113.3,113.4,113.5,113.6,113.7,113.8,113.9,114
2830 DATA 114.1,114.2,114.3,114.4,114.5,114.6,114.7,114.8,114.9,115
2850 DATA 115.1,115.2,115.3,115.4,115.5,115.6,115.7,115.8,115.9,116
2870 DATA 116.1,116.2,116.3,116.4,116.5,116.6,116.7,116.8,116.9,117
2890 DATA 117.1,117.2,117.3,117.4,117.5,117.6,117.7,117.8,117.9,118
2910 DATA 118.1,118.2,118.3,118.4,118.5,118.6,118.7,118.8,118.9,119
2930 DATA 119.1,119.2,119.3,119.4,119.5,119.6,119.7,119.8,119.9,120
2950 DATA 120.1,120.2,120.3,120.4,120.5,120.6,120.7,120.8,120.9,121
2970 DATA 121.1,121.2,121.3,121.4,121.5,121.6,121.7,121.8,121.9,122
2990 DATA 122.1,122.2,122.3,122.4,122.5,122.6,122.7,122.8,122.9,123
3010 DATA 123.1,123.2,123.3,123.4,123.5,123.6,123.7,123.8,123.9,124
3030 DATA 124.1,124.2,124.3,124.4,124.5,124.6,124.7,124.8,124.9,125
3050 DATA 125.1,125.2,125.3,125.4,125.5,125.6,125.7,125.8,125.9,126
3070 DATA 126.1,126.2,126.3,126.4,126.5,126.6,126.7,126.8,126.9,127
3090 DATA 127.1,127.2,127.3,127.4,127.5,127.6,127.7,127.8,127.9,128
3110 DATA 128.1,128.2,128.3,128.4,128.5,128.6,128.7,128.8,128.9,129
3130 DATA 129.1,129.2,129.3,129.4,129.5,129.6,129.7,129.8,129.9,130
3150 DATA 130.1,130.2,130.3,130.4,130.5,130.6,130.7,130.8,130.9,131
3170 DATA 131.1,131.2,131.3,131.4,131.5,131.6,131.7,131.8,131.9,132
3190 DATA 132.1,132.2,132.3,132.4,132.5,132.6,132.7,132.8,132.9,133
3210 DATA 133.1,133.2,133.3,133.4,133.5,133.6,133.7,133.8,133.9,134
3230 DATA 134.1,134.2,134.3,134.4,134.5,134.6,134.7,134.8,134.9,135
3250 DATA 135.1,135.2,135.3,135.4,135.5,135.6,135.7,135.8,135.9,136
3270 DATA 136.1,136.2,136.3,136.4,136.5,136.6,136.7,136.8,136.9,137
3290 DATA 137.1,137.2,137.3,137.4,137.5,137.6,137.7,137.8,137.9,138
3310 DATA 138.1,138.2,138.3,138.4,138.5,138.6,138.7,138.8,138.9,139
3330 DATA 139.1,139.2,139.3,139.4,139.5,139.6,139.7,139.8,139.9,140
3350 DATA 140.1,140.2,140.3,140.4,140.5,140.6,140.7,140.8,140.9,141
3370 DATA 141.1,141.2,141.3,141.4,141.5,141.6,141.7,141.8,141.9,142
3390 DATA 142.1,142.2,142.3,142.4,142.5,142.6,142.7,142.8,142.9,143
3410 DATA 143.1,143.2,143.3,143.4,143.5,143.6,143.7,143.8,143.9,144
3430 DATA 144.1,144.2,144.3,144.4,144.5,144.6,144.7,144.8,144.9,145
3450 DATA 145.1,145.2,145.3,145.4,145.5,145.6,145.7,145.8,145.9,146
3470 DATA 146.1,146.2,146.3,146.4,146.5,146.6,146.7,146.8,146.9,147
3490 DATA 147.1,147.2,147.3,147.4,147.5,147.6,147.7,147.8,147.9,148
3510 DATA 148.1,148.2,148.3,148.4,148.5,148.6,148.7,148.8,148.9,149
3530 DATA 149.1,149.2,149.3,149.4,149.5,149.6,149.7,149.8,149.9,150
3550 DATA 150.1,150.2,150.3,150.4,150.5,150.6,150.7,150.8,150.9,151
3570 DATA 151.1,151.2,151.3,151.4,151.5,151.6,151.7,151.8,151.9,152
3590 DATA 152.1,152.2,152.3,152.4,152.5,152.6,152.7,152.8,152.9,153
3610 DATA 153.1,15
```

Programming: BBC

2400 COLOR 2

2450 PRINT "In kitchen there you see
y. brown the dark red keeping the
away from the screen by pressing the
space key" (segment)

2460 PRINT "You will after a while see
text with a 'dangerous' message saying
sander, and 'a' and 'is anything but
a' 'in'. Then the screen leaves colored much
more in color"

2470 PRINT "Wait, a while if the color
of the screen there are fatal to both you
and the computer"

2480 PRINT "On later screens a letter
like 'a' will appear, the number of
and with the screen and so with the
of the screen"

2490 PRINT "There are five screens and
two of them are fatal to both you
and the computer. The number of
start with three lines. Although
of the first screens"

2500 COLOR 2

2510 PRINT "The screen (PAGE 249 to 2
500)

2520 REPEAT UNTIL GETKEY

2530 PRINT

2540 PRINT "The screen

2550 PRINT "The screen (PAGE 251 to 254)

2560 PRINT "The screen (PAGE 255 to 258)

2570 PRINT "The screen (PAGE 259 to 262)

2580 PRINT "The screen (PAGE 263 to 266)

2590 PRINT "The screen (PAGE 267 to 270)

2600 PRINT "The screen (PAGE 271 to 274)

2610 PRINT "The screen (PAGE 275 to 278)

2620 PRINT "The screen (PAGE 279 to 282)

2630 PRINT "The screen (PAGE 283 to 286)

2640 PRINT "The screen (PAGE 287 to 290)

2650 PRINT "The screen (PAGE 291 to 294)

2660 PRINT "The screen (PAGE 295 to 298)

2670 PRINT "The screen (PAGE 299 to 302)

2680 PRINT "The screen (PAGE 303 to 306)

2690 PRINT "The screen (PAGE 307 to 310)

2700 PRINT "The screen (PAGE 311 to 314)

2710 PRINT "The screen (PAGE 315 to 318)

2720 PRINT "The screen (PAGE 319 to 322)

2730 PRINT "The screen (PAGE 323 to 326)

2740 PRINT "The screen (PAGE 327 to 330)

2750 PRINT "The screen (PAGE 331 to 334)

2760 PRINT "The screen (PAGE 335 to 338)

2770 PRINT "The screen (PAGE 339 to 342)

2780 PRINT "The screen (PAGE 343 to 346)

2790 PRINT "The screen (PAGE 347 to 350)

2800 PRINT "The screen (PAGE 351 to 354)

2810 PRINT "The screen (PAGE 355 to 358)

2820 PRINT "The screen (PAGE 359 to 362)

2830 PRINT "The screen (PAGE 363 to 366)

2840 PRINT "The screen (PAGE 367 to 370)

2850 PRINT "The screen (PAGE 371 to 374)

2860 PRINT "The screen (PAGE 375 to 378)

2870 PRINT "The screen (PAGE 379 to 382)

2880 PRINT "The screen (PAGE 383 to 386)

2890 PRINT "The screen (PAGE 387 to 390)

2900 PRINT "The screen (PAGE 391 to 394)

2910 PRINT "The screen (PAGE 395 to 398)

2920 PRINT "The screen (PAGE 399 to 402)

2930 PRINT "The screen (PAGE 403 to 406)

2940 PRINT "The screen (PAGE 407 to 410)

2950 PRINT "The screen (PAGE 411 to 414)

2960 PRINT "The screen (PAGE 415 to 418)

2970 PRINT "The screen (PAGE 419 to 422)

2980 PRINT "The screen (PAGE 423 to 426)

2990 PRINT "The screen (PAGE 427 to 430)

3000 PRINT "The screen (PAGE 431 to 434)

3010 PRINT "The screen (PAGE 435 to 438)

3020 PRINT "The screen (PAGE 439 to 442)

3030 PRINT "The screen (PAGE 443 to 446)

3040 PRINT "The screen (PAGE 447 to 450)

3050 PRINT "The screen (PAGE 451 to 454)

3060 PRINT "The screen (PAGE 455 to 458)

3070 PRINT "The screen (PAGE 459 to 462)

3080 PRINT "The screen (PAGE 463 to 466)

3090 PRINT "The screen (PAGE 467 to 470)

3100 PRINT "The screen (PAGE 471 to 474)

3110 PRINT "The screen (PAGE 475 to 478)

3120 PRINT "The screen (PAGE 479 to 482)

3130 PRINT "The screen (PAGE 483 to 486)

3140 PRINT "The screen (PAGE 487 to 490)

3150 PRINT "The screen (PAGE 491 to 494)

3160 PRINT "The screen (PAGE 495 to 498)

3170 PRINT "The screen (PAGE 499 to 502)

3180 PRINT "The screen (PAGE 503 to 506)

3190 PRINT "The screen (PAGE 507 to 510)

3200 PRINT "The screen (PAGE 511 to 514)

3210 PRINT

3220

3230 PRINT "The screen

3240 PRINT "The screen (PAGE 515 to 518)

3250 PRINT "The screen (PAGE 519 to 522)

3260 PRINT "The screen (PAGE 523 to 526)

3270 PRINT "The screen (PAGE 527 to 530)

3280 PRINT "The screen (PAGE 531 to 534)

3290 PRINT "The screen (PAGE 535 to 538)

3300 PRINT "The screen (PAGE 539 to 542)

3310 PRINT "The screen (PAGE 543 to 546)

3320 PRINT "The screen (PAGE 547 to 550)

3330 PRINT "The screen (PAGE 551 to 554)

3340 PRINT "The screen (PAGE 555 to 558)

3350 PRINT "The screen (PAGE 559 to 562)

3360 PRINT "The screen (PAGE 563 to 566)

3370 PRINT "The screen (PAGE 567 to 570)

3380 PRINT "The screen (PAGE 571 to 574)

3390 PRINT "The screen (PAGE 575 to 578)

3400 PRINT "The screen (PAGE 579 to 582)

3410 PRINT "The screen (PAGE 583 to 586)

3420 PRINT "The screen (PAGE 587 to 590)

3430 PRINT "The screen (PAGE 591 to 594)

3440 PRINT "The screen (PAGE 595 to 598)

3450 PRINT "The screen (PAGE 599 to 602)

3460 PRINT "The screen (PAGE 603 to 606)

3470 PRINT "The screen (PAGE 607 to 610)

3480 PRINT "The screen (PAGE 611 to 614)

3490 PRINT "The screen (PAGE 615 to 618)

3500 PRINT "The screen (PAGE 619 to 622)

3510 PRINT "The screen (PAGE 623 to 626)

3520 PRINT "The screen (PAGE 627 to 630)

3530 PRINT "The screen (PAGE 631 to 634)

3540 PRINT "The screen (PAGE 635 to 638)

3550 PRINT "The screen (PAGE 639 to 642)

3560 PRINT "The screen (PAGE 643 to 646)

3570 PRINT "The screen (PAGE 647 to 650)

3580 PRINT "The screen (PAGE 651 to 654)

3590 PRINT "The screen (PAGE 655 to 658)

3600 PRINT "The screen (PAGE 659 to 662)

3610 PRINT "The screen (PAGE 663 to 666)

3620 PRINT "The screen (PAGE 667 to 670)

3630 PRINT "The screen (PAGE 671 to 674)

3640 PRINT "The screen (PAGE 675 to 678)

3650 PRINT "The screen (PAGE 679 to 682)

3660 PRINT "The screen (PAGE 683 to 686)

3670 PRINT "The screen (PAGE 687 to 690)

3680 PRINT "The screen (PAGE 691 to 694)

3690 PRINT "The screen (PAGE 695 to 698)

3700 PRINT "The screen (PAGE 699 to 702)

3710 PRINT "The screen (PAGE 703 to 706)

3720 PRINT "The screen (PAGE 707 to 710)

3730 PRINT "The screen (PAGE 711 to 714)

3740 PRINT "The screen (PAGE 715 to 718)

3750 PRINT "The screen (PAGE 719 to 722)

3760 PRINT "The screen (PAGE 723 to 726)

3770 PRINT "The screen (PAGE 727 to 730)

3780 PRINT "The screen (PAGE 731 to 734)

3790 PRINT "The screen (PAGE 735 to 738)

3800 PRINT "The screen (PAGE 739 to 742)

3810 PRINT "The screen (PAGE 743 to 746)

3820 PRINT "The screen (PAGE 747 to 750)

3830 PRINT "The screen (PAGE 751 to 754)

3840 PRINT "The screen (PAGE 755 to 758)

3850 PRINT "The screen (PAGE 759 to 762)

3860 PRINT "The screen (PAGE 763 to 766)

3870 PRINT "The screen (PAGE 767 to 770)

3880 PRINT "The screen (PAGE 771 to 774)

3890 PRINT "The screen (PAGE 775 to 778)

3900 PRINT "The screen (PAGE 779 to 782)

Programming: Amstrad CPC

Xen

by Simon Goodwin

On we go with part two of Xen for the Amstrad CPC's.

:Ascii, start address, length returns text anywhere in memory.

:Proflen returns the length of CPC464 Basic programs.

:Deek, address, @n% and :Doke, address, 16 bit number perform a two byte Peek or Poke.

:Pron and :Proff direct all output to the printer and revert things to normal.

:Key, @n% returns the Ascii value of a key pressed. Much faster than :Inkey.

:Flush flushes the keyboard buffer.

:Shift, source address, destination address, length moves a block of memory to a new location.

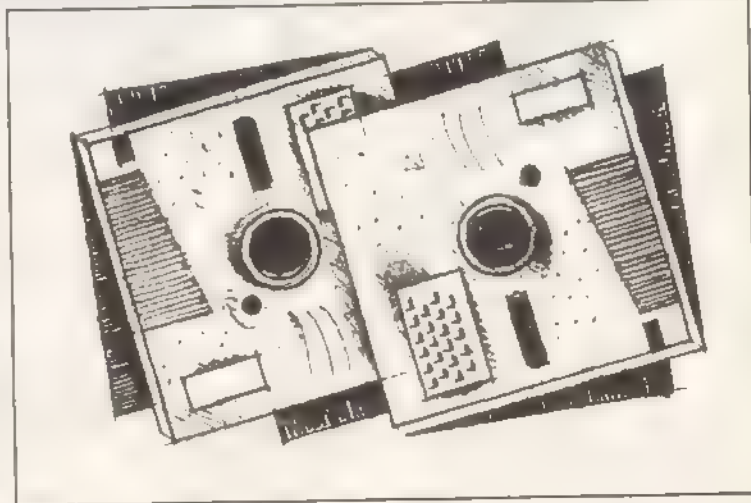
:Disable and :Enable affects the break key.

:Waitkey waits for a key to be pressed.

:Rompeek, rom, address, n% is used to examine either the upper (rom=1) or lower (rom=0) Rom. The start address should be between zero and 16384 for the lower Rom or 49152 and 65536 for the upper Rom.

:Help lists all the Xen commands.

Note that where a command requires a variable which is prefixed by @ the variable should be defined before using the command. ■ type a%=0



2400 DATA 21, 119, 0, 201, 120, 1, 205, 119, 201, 205, 205, 197, 205, 7, 197, 21, 221, 121, 0, 221, 121, 1, 205, 27, 187, 119, 201, 40, 191, 174, 22, 7, 91, 129, 174, 237, 80, 205, 187, 15, 4, 210, 6, 205, 215, 27, 187, 14, 201, 2, 61, 21, 210 DATA 119, 0, 201, 120, 0, 119, 24, 7, 187, 163, 240, 245, 205, 241, 199, 21, 8, 199, 109, 241, 24, 227, 241, 201, 4, 240, 205, 240, 199, 48, 249, 124, 50, 187, 163, 240, 245, 205, 241, 199, 21, 8, 199, 109, 241, 24, 227, 241, 201, 4,

240, 201, 199, 2, 201, 120, 3, 221, 120, 119, 25, 221, 120, 1, 119, 201, 42, 212, 109, 24, 162, 163, 33, 170, 163, 34, 1, 212, 109, 201, 42, 162, 163, 34, 212, 199, 201, 210 DATA 245, 58, 161, 163, 199, 58, 7, 60, 10, 205, 240, 199, 48, 249, 124, 50, 187, 163, 240, 245, 205, 241, 199, 21, 8, 199, 109, 241, 24, 227, 241, 201, 4,


```

0: 0 211 111 3 111 111 3 111 3
4: 0 121 16 1 62 21 107 16 105
10
100 DATA 101 111 3 111 111 3 111
141 1 111 16 1 62 21 105 107 109
1 101 105 109 107 62 44 7 64
4 12 165 165 105 161 109 101 31
18 165 31 1 1 6 16 105 173 164
1 31 165 165 116 104 6 31 11 101
1 31
141 DATA 121 167 6 15 31 1 17 115
1 171 164 101 31 169 165 1 1 1 31
1 1 17 105 173 164 101 21 44 165
1 31 3 1 6 14 105 173 164 21 16
3 165 1 1 1 1 94 111 101 15 109
16 165 105 31 107 141 104 16 10
14
100 DATA 11 11 111 165 5 7 31 31
19 105 173 164 14 49 104 31 31
14 101 31 11 165 1 1 1 1 1 1
105 173 164 14 31 104 41 11 14
111 31 111 165 1 7 31 1 19 105
173 164 14 1 1 101 11 167 165 6
17 10

```

```

160 DATA 3 19 105 173 164 101 11
61 165 31 1 6 16 105 173 164
111 31 165 105 104 1 1 1 1 1
161 31 105 105 164 101 31 76 16
5 11 7 1 6 16 105 173 164 101
31 169 165 101 111 14 111 102 2
5 107
170 DATA 127 164 101 31 31 167 31
3 1 6 16 105 173 164 111 11 169
165 101 11 16 101 11 17 105
107 164 101 105 107 101 116
1 105 91 107 101 95 11 141 111
111 141 61 31 105 91 107 141 11
5 114
100 DATA 105 105 164 105 105 105 1
64 101 105 101 164 91 167 165 10
5 31 107 31 41 165 105 31 107
11 105 101 141 111 61 101 61
111 111 101 61 105 141 164 101
111 141 101 11 105 141 164 101
161 165
100 DATA 101 104 11 56 3 166 55 1
11 111 41 101 105 111 109 101 10
5 111 109 101 31 111 1 61 11 10

```

```

5 164 109 101 31 77 1 61 105 105
114 109 101 71 73 75 69 79 61
77 69 31 31 31 31 31 31 31 31
170
101 DATA 71 75 69 31 64 31 81 69
31 31 31 31 31 31 31 31 31 31
61 14 11 61 61 61 61 61 61 61 61
31 51 31 75 69 79 71 84 71 31
31 31 31 31 31 31 31 31 31 31
91 69 67 31 31 31 31 31 31 31
31 31
101 DATA 31 51 31 41 61 61 61 61 71
67 41 41 61 71 79 61 31 91 41
41 61 61 67 71 71 41 61 71 61
77 61 61 31 71 71 71 69 31 31
31 31 31 31 41 61 31 71 84 69
67 31 69 61 31 61 61 61 71 67
41 1
101 DATA 1 1 1 1 1 31 41 61 41
31 31 31 31 41 61 41 61 41 61
54 11 31 31 1 101 1 64 1 101 1
1 71 16 101 11 31 141 11 31 101
1 101

```

Memory Recall

by Endaff Bowen

The following menu driven program provides a way of examining the contents of memory, altering them

and then rewriting to memory or microdrive. The left and right arrow keys move

backwards and forwards in memory whilst Enter saves the contents in memory.

```

100 REM *** MEMORY RECALL ***
110
120 REM *** PROGRAM ***
130 REM *** LOCATION ***
140 REM *** LOCATION ***
150
160 REM *** MEMORY ***
170 REM *** MEMORY ***
180 REM *** MEMORY ***
190 REM *** MEMORY ***
200 REM *** MEMORY ***
210 REM *** MEMORY ***
220 REM *** MEMORY ***
230 REM *** MEMORY ***
240 REM *** MEMORY ***
250 REM *** MEMORY ***
260 REM *** MEMORY ***
270 REM *** MEMORY ***
280 REM *** MEMORY ***
290 REM *** MEMORY ***
300 REM *** MEMORY ***
310 REM *** MEMORY ***
320 REM *** MEMORY ***
330 REM *** MEMORY ***
340 REM *** MEMORY ***
350 REM *** MEMORY ***
360 REM *** MEMORY ***
370 REM *** MEMORY ***
380 REM *** MEMORY ***
390 REM *** MEMORY ***
400 REM *** MEMORY ***
410 REM *** MEMORY ***
420 REM *** MEMORY ***
430 REM *** MEMORY ***
440 REM *** MEMORY ***
450 REM *** MEMORY ***
460 REM *** MEMORY ***
470 REM *** MEMORY ***
480 REM *** MEMORY ***
490 REM *** MEMORY ***
500 REM *** MEMORY ***
510 REM *** MEMORY ***
520 REM *** MEMORY ***
530 REM *** MEMORY ***
540 REM *** MEMORY ***
550 REM *** MEMORY ***
560 REM *** MEMORY ***
570 REM *** MEMORY ***
580 REM *** MEMORY ***
590 REM *** MEMORY ***
600 REM *** MEMORY ***
610 REM *** MEMORY ***
620 REM *** MEMORY ***
630 REM *** MEMORY ***
640 REM *** MEMORY ***
650 REM *** MEMORY ***
660 REM *** MEMORY ***
670 REM *** MEMORY ***
680 REM *** MEMORY ***
690 REM *** MEMORY ***
700 REM *** MEMORY ***
710 REM *** MEMORY ***
720 REM *** MEMORY ***
730 REM *** MEMORY ***
740 REM *** MEMORY ***
750 REM *** MEMORY ***
760 REM *** MEMORY ***
770 REM *** MEMORY ***
780 REM *** MEMORY ***
790 REM *** MEMORY ***
800 REM *** MEMORY ***
810 REM *** MEMORY ***
820 REM *** MEMORY ***
830 REM *** MEMORY ***
840 REM *** MEMORY ***
850 REM *** MEMORY ***
860 REM *** MEMORY ***
870 REM *** MEMORY ***
880 REM *** MEMORY ***
890 REM *** MEMORY ***
900 REM *** MEMORY ***
910 REM *** MEMORY ***
920 REM *** MEMORY ***
930 REM *** MEMORY ***
940 REM *** MEMORY ***
950 REM *** MEMORY ***
960 REM *** MEMORY ***
970 REM *** MEMORY ***
980 REM *** MEMORY ***
990 REM *** MEMORY ***
1000 REM *** MEMORY ***

```


Block Delete

by Graham Young

This Spectrum program can be used to delete blocks of lines from programs. Just enter the following line and save it. Then, when you want to use it, merge it with the target program.

To delete a block mark it out by placing *Data 0* at the start and finish of the block. Then, type *Goto 9999* and enter the line numbers of the two *Data* statements. Now delete the first *Data 0* statement and the rest of the block will be deleted with it.

```
9999 INPUT X1,X1: RESTORE X1: READ X1: L
ET X1=PEEK 23630+154:PEEK 23640+1: RESTO
RE X1: READ X2: LET X2=PEEK 23630+155:PE
EK 23640+2: LET X3=X1-X2: POKE X2-1,X3-1
NT (X1+155)*156: POKE X2-1,INT (X3/156)
```

Double Height

by R Doughty

This program for the Spectrum will create double height text. The routine takes approximately 30 seconds to create the two character sets (which can be saved with *Save "Dbl" Code 63232,1536*) necessary.

Lines 70 to 90 demonstrate how to use the routine. The variable *A\$* contains the text, *r* is the line number and *c* is the column where the text is to be printed.

```
10 FOR n=1 TO 255 STEP 16
20 FOR c=1 TO 22
30 FOR c=7 TO 0 STEP -1
40 PAPER c: PRINT " ";
50 NEXT c:NEXT n
60 BRIGHT 0: PAPER 7
70 IF INKEY$="" THEN GO TO 70
80 CLS
90 FOR y=0 TO 175 STEP 16
100 PLOT 0,y
110 DRAW 255,0
120 NEXT y
130 FOR x=0 TO 255 STEP 16
140 PLOT x,0
150 DRAW 0,175
160 NEXT x
170 PLOT 255,175: DRAW 0,-175
180 PLOT 0,175: DRAW 255,0
190 CIRCLE 127,88,84
200 IF INKEY$="" THEN GO TO 200
210 GO TO 10
```

TV Test Pattern

by John Yobec

The following Spectrum program will enable you to discern whether your TV set is functioning correctly.

On running the program a colour bar containing six colours will be displayed. They are, in order, yellow, cyan, green, magenta, red and blue. If any of the colours are incorrect then your set is in need of repair or adjustment.

Now, press any key and then a circle and cross hatch display will appear. The lines of this pattern should be sharp. If not then adjust the focus.

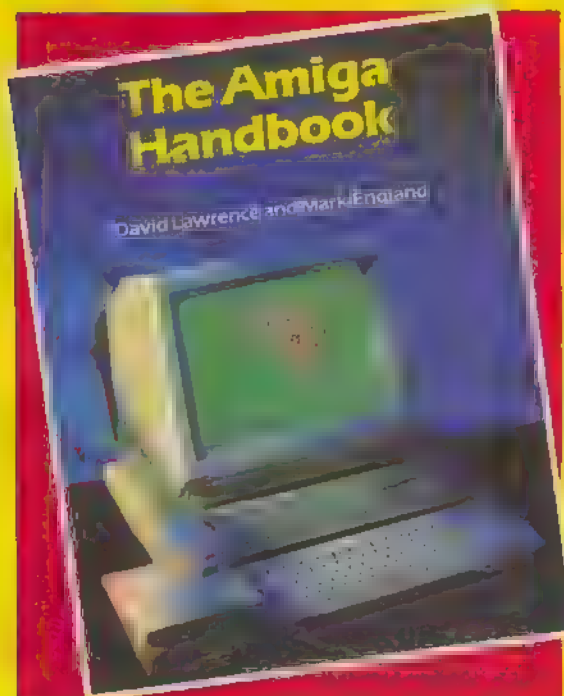
If the lines are not black then your convergence needs adjustment. If the circle is egg shaped then linearity needs adjusting.

```
10 BRIGHT 1
20 FOR n=1 TO 22
30 FOR c=7 TO 0 STEP -1
40 PAPER c: PRINT " ";
50 NEXT c:NEXT n
60 BRIGHT 0: PAPER 7
70 IF INKEY$="" THEN GO TO 70
80 CLS
90 FOR y=0 TO 175 STEP 16
100 PLOT 0,y
110 DRAW 255,0
120 NEXT y
130 FOR x=0 TO 255 STEP 16
140 PLOT x,0
150 DRAW 0,175
160 NEXT x
170 PLOT 255,175: DRAW 0,-175
180 PLOT 0,175: DRAW 255,0
190 CIRCLE 127,88,84
200 IF INKEY$="" THEN GO TO 200
210 GO TO 10
```




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With Kenn Garroch

Bored with games

A Harvey of Wellingborough, Northamptonshire, writes:

Q I recently bought a Commodore 64 and after getting bored with playing games, decided to try my hand at programming in Basic. All went well until I came across the commands AND, OR and NOT. What do these do and why do they not always appear to work correctly?

A The logical operations AND, OR and NOT can be used in two ways. The most obvious is for dealing with situations where things are true or false. The other use is for bit orientated operations, perhaps the most useful in the long run.

On the Commodore, any non-zero value between -32768 and 32767 is regarded as being true, zero being false as the following program shows.

```
10 A=1
20 IF A THEN PRINT "A IS TRUE"
30 A=0
40 IF A THEN PRINT "A IS STILL TRUE"
```

If you had a program that took in a set of responses to questions, either true or false (One or zero), the AND operator could be used to test them e.g.

```
IF A AND B AND C AND D THEN "ALL ANSWERS ARE TRUE"
```

The problem comes when you want to test if some are true and some are false. Here it is best to use -1 as true since NOT -1 is 0 and NOT 0 is -1. As I will explain in a mo, this is due to the bitwise

operation of the logical operators and the way in which integers are stored. Unfortunately, for logic statements, it is not always possible to use the AND and OR operators on any old values, you must make sure that you stick to one value for true i.e. -1 and 0 for false otherwise, things will go awry.

The whole thing becomes more obvious when the bitwise logical operations are used. The computer stores numbers in 16 bit binary form (-32768 to 32767, the most significant bit being used to denote plus or minus), these bits can be one or zero. Taking the logical operations on two bits, they are. Considering all possible values of bit 1 and bit 2

	bit1	bit2	AND	OR
bit1	bit2	bit2	bit2	bit2
0	0	0	0	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	1

These are known as truth tables and show the results of all possible inputs to the functions AND and OR.

Fun with the 6502

B Devlin of Norwich, Norfolk, writes:

Q I have been playing around with the 6502, for fun more than anything else. One part of the processor I don't understand are the interrupts and how they work. Could you explain what IRQ and NMI are?

A The 6502 microprocessor has a number of interrupt possibilities, the main ones are IRQ (interrupt request) and NMI (non-maskable interrupt). Reset is also an interrupt but is used for power up purposes only i.e. it causes the microprocessor to jump to its first instruction. On the 6502 chip itself, there are pins available for the IRQ, NMI, and RST inputs. These are all active low which means that, ordinarily, they are held at 5 volts, but an external piece of hardware is used to pull them down to 0

volts informing the processor that an interrupt has occurred.

Once the 6502 has been notified of an interrupt, it drops what it is doing and jumps to the specified interrupt service routine. The addresses of these routines are kept at the top of memory from FFFA to FFFF (hex). The first is the NMI address kept in two bytes in locations FFFA (low 8 bits) and FFFB (high 8 bits). Following this is the reset address in FFFC and FFFD (again low high respectively) and finally the IRQ address in FFFE and FFFF. Before going to the service routine, the 6502 stores the processor status, and the value of the program counter on the stack. These can then be accessed by the RTI (return from interrupt) instruction to continue the program where it left off. The NMI interrupt cannot be stopped if the NMI pin is pulled low (obviously this is why it is called non-maskable). On the other hand, the status register contains a mask bit for the IRQ interrupt which, if set, denies the processor access to the interrupt service routine. This is cleared (using the CLI instruction), the processor will save its current position and jump to the routine whose address is given in locations FFFE and FFFF. At this point, the processor also sets the mask bit in the status register to disable any other IRQs that might come along. The mask bit can also be controlled from the program with the SEI and CLI instructions to set and clear the bit respectively.

The reset line can also be used as an interrupt although most systems won't allow this since the signal also goes to the reset pins of all the external circuitry. The 6502 also has a hangover from the 6800 processor called the software interrupt. This instruction (BRK) causes the processor to think an IRQ has occurred although BRK is not disabled by the IRQ mask bit. The vector (address where the address of the interrupt routine is held) is the same as that for IRQ (FFFE and FFFF) and the IRQ mask bit is set by the processor when a BRK occurs. The break flag in the status register is also set so that the program can tell

whether the interrupt was caused by IRQ or BRK.

NMI, IRQ and BRK interrupt service routines are all terminated with the RTI instruction which causes the processor to retrieve the status register and the program counter from the stack to continue execution where it left off.

Forth From Basic

L. Burbridge of Hinkley, Leicestershire, writes:

Q I have been programming in Basic now for two years and have decided that it is time I branched out to another language. I would like to get a Forth for my micro but am put off by the use of Reverse Polish Notation. Could you explain the difference between this type of arithmetic and the normal kind I was taught in school?

A Reverse Polish Notation (RPN) is used in Forth because of the language's almost total dependence on the LIFO (Last In First Out) stack. Normal arithmetic puts its operators (+, -, x, /) in between the numbers to be operated on i.e. it is infix. RPN, on the other hand is postfix which means the operators come after the numbers. For example:

2+3 would be 23+ in RPN
2*3+10 could be 23+ 10x or 23 10+x in RPN

The latter example shows that RPN is a lot more specific without the need to resort to brackets or set forms.

In Forth, things must be placed onto the stack before they can be operated on. The sum 23+10x is entered as exactly that in Forth. Entering 2 and 3 puts them on the stack (from the bottom the stack is 23) entering + leaves 5 on the top of the stack (with nothing underneath). The 10 then leaves the stack with 510 on it. The x multiplies these two together leaving 50 on the top. The LIFO stack is therefore ideally suited to RPN and once you get the hang of it, it makes a lot of sense.

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Listen to your radio

David Wallin introduces radio communications, an alternative to modems

As I said a few weeks back, I'll be doing quite a bit on the use of radios for micro users to communicate with each other. The advantage of communicating via radio is the loss of high quarterly phone bills, the disadvantages are the loss of range and to a certain extent the cost of equipment.

This week we'll introduce the use of radio for communication, mainly dealing with receiving only. Why? Because to transmit you need a licence, which costs money and requires you to take an exam. Lots of stuff about transmitting will be pretty boring to a person with no licence and who therefore can't transmit or make use of the information.

This article should tell you where you can get more information, explain a few things, and for the most enthusiastic of you, tell you what equipment will be needed for listening so that you can get started.

The Radio Amateur Exam

As I said above, to transmit on the air waves you must first take, and pass, the radio amateur exam. The RSGB (Radio Society of Great Britain) supplies a comprehensive booklet telling you what's in the syllabus, conditions, costs, etc. This booklet is free on request to the RSGB, whose address is at the bottom of the page.

Required Equipment

Here's the part for those of you who wish to get started right away. Information about the required equipment. There are three main pieces of equipment required to use your micro to listen in on the airwaves. These are a communications receiver, an antenna, an interface (and or software).

Communications Receiver is the technical name given to a good quality short wave (high frequency) radio receiver. Second hand they cost about £80-£120, brand new they cost from £150 upwards. A 'normal' radio with SW reception can be used, though it is not really suitable as SSB and CW modes are required as well as AM. A good receiver (£100 upwards 2nd hand, from £250 new) should have a minimum specification of: 500kHz-30MHz coverage, more than 100Hz resolution, and

AM, USB, LSB and CW (morse) modes.

A variable bandwidth is an advantage, but an expensive one and is by no means vital. To get started cheaply, one of the radios with nine or 10 SW bands would suffice, though they are normal radios, not communications receivers.

A good antenna is vital for SW reception. A number of different antennae, including small satellite reception antennae, are advertised in amateur radio magazines. An active dipole is a popular SW amateur antenna and generally they are not too expensive and can even be home made. An active dipole is a good 'starter' antenna.

A serious radio enthusiast will have many antennae ranging from specialised antenna for satellite reception (super high frequency) to a general coverage antenna, such as an active dipole. Warning: an antenna should be kept well away from the computer as the CPU has a habit of causing bad interference.

There are a number of interfaces or terminal units on the market. These range from a £50 Maplin Electronics' RTTY kit to the highly expensive multi-mode TV's with everything from RTTY to Packet.

The Maplin Kit is a good TV and ideal for the beginner. It is not too expensive and offers good facilities for the price. It works with all RS 232 compatible micros. Another TV, for the C64, called the Pakrat PK-64, is available which offers: Morse, Baudot RTTY, Ascii RTTY, Amtor and Packet. This costs about £250 though, but does include software.

A good place to look for an interface or software is again in amateur radio magazines. Some micros will require special RTTY software and others will be able to use their normal telephone communications software.

There are packages available for the BBC, Spectrum and C64 which use the cassette port to take an input direct from the headphone socket on the receiver, by-passing the need for an interface. This makes reception a lot cheaper.

The total cost of equipment, for the beginner, could be from about £35 (only software, no TV or proper communications receiver) to about £200 (Second hand receiver, TV and software).

More to come on radio communications next week.

The most commonly used abbreviations in radio communications

AM	- Amplitude Modulated
AMRAC	- AMateur Radio and Computer (club)
AMTOR	- AMateur Telex Over Radio
BARTG	- British Amateur Radio Teleprinter Group
CW	- Morse
FM	- Frequency Modulated
FSK	- Frequency Shift Key
LSB	- Lower Side Band
RAMTOP	- Radio Amateur Microcomputer Techniques, Operations and Programs (society)
RIF	- Radio Interference Filter
RFI	- Radio Interference
RSGB	- Radio Society of Great Britain
RTTY	- Radio TeleType
SSB	- Single Side Band
SSTV	- Slow Scan TeleVision
TV	- Terminal Unit
USB	- Upper Side Band

frequencies

SHF	- Super High Frequency (30GHz-3GHz)
UHF	- Ultra High Frequency (3GHz-300MHz)
VHF	- Very High Frequency (300MHz-30MHz)
HF	- High Frequency (30MHz-3MHz)
MF	- Medium Frequency (3MHz-300kHz)
LF	- Low Frequency (300kHz-30kHz)
VLF	- Very Low Frequency (30kHz-3kHz)

Tape reviews and PCW's musical news

Mark Jenkins brings you musical news from the all-encompassing PCW show

No shortage of music products for a wide range of machines at the Personal Computer World Show. Ranging from a £29.95 complete music system for the Spectrum to pro quality software and hardware for the Atari ST, the latest products proved that music and micros go together right across the market.

Perhaps most impressive for sheer power and economy was the RAM Music Machine for the Spectrum. Designed by Sinclair offshoots Flare Technology, the Music Machine crams an incredible amount in one small plug-in package. It features an eight-voice digitally-sampled drum machine, which can be played directly from the keyboard or programmed (up to three voices can play at once) to create rhythm patterns which can be chained into 255-pattern songs. There's a "piano" function which allows you to play instrument sounds from the keys or from a Midi keyboard; a bar editor to create and edit tunes; a tune editor to form songs from recorded patterns; a sampler with editing features, waveform display, zoom feature, multi-sampling and effects such as digital delay; and full Midi out control over synths via the In, Out and Through sockets. You can play pre-set sample sounds off your Midi keyboard, or replace them with your own samples.

The software is menu-driven and seems clear and easy to use, and the pack comes equipped with the microphone you'll need for sampling, and a demo tape. Cost? Not £200, not £100, but £49.95. We'll publish a full review as soon as possible. An Amstrad version is on the way too.

Just along the balcony was the Cheetah Marketing Stand, showing the long-promised Midi interface and sound sampler for the Spectrum. If you bought the Cheetah SpecDrum, Midi Interface and Sound Sampler you would have spent almost £130. Does the Ram Music Machine outperform the lot at £49.95? We'll be able to tell you when we get all four products to review!

Further up-market, Hybrid Arts showed some impressive Midi software for the Atari ST in the Atari Village. EZ-

Track ST is a 20-track real-time Midi recorder with extensive editing facilities which should enable you to produce a note-perfect performance. DX-Droid and CZ-Droid are software sound library packages for the Yamaha and Casio synths, which include "intelligent" sound creation routines which enable you to create new sounds more easily. On the hardware side, ADAP is a "sound workstation", basically a sampler with extensive editing facilities. 16-bit sampling at 44.1KHz gives a 20 second sample. At 10KHz you can have an astounding 80 second monophonic sample. The ADAP is fully Midi competi-



ble, allows stereo panning, 64-way multi-sampling, delay, reverb, oscilloscope displays, on-screen sample editing featuring cut and paste, auto-looping, full compatibility with the new Midi sample information standard, and lots more. Threatening to outperform multi-thousand pound studio gear like Bel and Rebis devices, the ADAP is standard 19-inch studio rack-mounting and costs \$1995. Prices and distribution for the Hybrid Arts products in the UK have not yet been fixed.

Some interesting bits and bobs in the post sack. Paul Wood of Wooden Software, Worcester, is working on Midi hardware and software for the Memotech machine. The prototype board is apparently up and working, and the software, designed specifically for the Casio and Roland synths (although presumably it will work with all Midi gear) is under development. Paul would welcome enquiries from Memotech owners, or anyone else with specific Midi instru-



ments in mind, on 0905-24260 (after 6.00 pm) or at Wooden Software, 12 Bishops Avenue, Worcester WR3 8XA.

Lastly, an excellent audio tape from Andrew Wilson of Edinburgh. Andrew's system proves that Midi and computer control allow you to dispense with expensive eight- or sixteen-track recorders. Unfortunately, Andrew seems to have spent a fortune on synths instead, with a Mirage sampler, Yamaha DX7, TX7, Oscar monosynth, Sequential Six-Trak, and the awesome Elka Synthex appearing on the tape together with Yamaha RX15 drums. All the music is sequenced live using a BBC B with the UMI soft/hardware package. This powerful (though, in some people's opinion, overpriced) package allows very sophisticated real-time and step-time compositions to be built up. Andrew's pieces showcase the power of the sequences, as well as the abilities of the instruments, in a series of pieces which are recorded directly to the master stereo tape. This results in excellent recording quality and complete control over the music and sounds using the UMI's editing features. One problem in recording in this way is that unless you have a big mixer with a lot of effects sends, the plenty of reverb and echo units, the overall ambience of each piece is difficult to vary. Most of Andrew's pieces, which are fairly light, up-tempo instrumentals sounding very much like advertising jingles (and that's meant as a compliment!) are awash with the same sort of reverb setting for each instrument - but with the introduction of more and more Midi-controlled effects units, such as the economical Alessis Midiverb, even this aspect of recording should be under Midi control from your computer soon. If anyone would like to hear a copy of Andrew's excellent tape, send an s.a.e. to this column and we'll forward it to Andrew.

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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John Cook looks through this week's new arrivals

Amiga

Program *The Pawn Type* Adventure **Micro** Amiga **Price** £24.95 **Supplier** Rainbird Software, 64-67 New Oxford Street, London WC1.

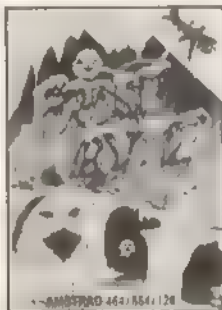
Amstrad CPC

Program *The GCP Art Studio Type* Utility **Micro** Amstrad 6128 **Price** £19.95 **Supplier** Rainbird Software, 74-76 New Oxford Street, London WC1.

Program *Miami Dice Type* Arcade **Micro** Amstrad CPC **Price** £2.99 **Supplier** Bug-Byte, Victory House, Leicester Place, London WC2.

Program *Frost Byte Type* Arcade Adventure **Micro** Amstrad CPC **Price** £9.95 **Supplier** Mikro-Gen, Unit 15, Western Centre, Bracknell, Berks.

Did you ever have one of those Slinky spring things that you could make walk downstairs by themselves? More interestingly, has anyone ever found another use for the little bleeders? Mikro-Gen has - by making one the star of its latest Amstrad opus, *Frost Byte*.



In this scenario, it seems that Keezers (Slinkys to you) are being captured all over the frozen world of Cosmia, and it is up to you (playing the only Keezer to break free) to liberate your Keezer brethren from the goulsh monsters that are your captors.

This involves collecting different types of ammunition... and eating different

types of sweets. Teenage hero Ricky Steel he isn't, and although it's nothing out of the ordinary, the chances are you'll quite enjoy flopping around the colourful and nicely animated screens of this one.

Especially if you recently bought yourself a Slinky.

Atari

Program *Jewels of Darkness Type* Adventure **Micro** Atari 800/130 **Price** £14.95 **Supplier** Rainbird Software, 64-67 New Oxford Street, London WC1.

Program *Leaper Type* Arcade **Micro** Atari XL/XE **Price** £2.99 **Supplier** Bug-Byte, Victory House, Leicester Place, London WC2.

BBC/Electron

Program *The Last of the Free Type* Arcade Adventure **Micro** BBC/Electron **Price** £7.95 **Supplier** Audiogenic, PO Box 88, Reading, Berkshire RG7 4AA.

Program *Psycastris Type* Arcade **Micro** BBC/Electron **Price** £7.95 (tape) £11.95 (disc) **Supplier** Audiogenic, PO Box 88, Reading, Berkshire RG7 4AA.

Program *Galaforce Type* Arcade **Micro** BBC/Electron **Price** £9.95 (tape) £11.95 (disc) **Supplier** Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.

There are some games that deserve great praise for being original. *Galaforce* is not one of these. However, it is worth going gaga over because it draws from several very old shoot-em-up concepts, almost every classic from *Galaxian* upwards in fact, and presents it so well that you can't help but sit back and applaud.

Alternatively, you can crouch forward in frustration at not being able to get past the eighth screen and bang your fists up and down on the

Program *Tomahawk Type* Simulation **Micro** Amstrad PCW **Price** £19.95 **Supplier** Digital Intergration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.



This is the stuff - this is what the kids want - this is what the accountants want more to the point. As if it needed making even more emphatically, what we have here is a flight simulator on the PCW. You know, the word processor that nice Mr Sugar started selling late last year.

Tomahawk is a direct conversion of the program that was so successful on Spectrum, Amstrad CPC, Atari and Commodore 64. And it might

be green, but it's great. Being from Digital Intergration, simulation supremos, it is not easy to play. Helicopters aren't supposed to be easy you know.

To start off with, try reading the detailed résumé on aeronautics in general and the Hughes Apache Advanced Attack Helicopter in particular. Learn all about thrust and drag, translational lift and ground cushions. Then read the instruction, then take off... then crash spectacularly into the ground.

There's always a logical explanation for this, of course. A message comes up - my favourite was "Sink rate to high". Sink rate? Still, as with all quality games, practice is well rewarded.

And when you've mastered the flying bit, it's kill, kill, maim with the three on-board weapon systems.

Bags of different features, difficulty levels, etc - joystick compatible, if you've already invested in one, and challenging without being unplayable.

The lack of sound effects does add a rather unearthly atmosphere to the thing, but if you have to get one arcade game for your Joyce, then this has to be it.

keyboard until it breaks. Which is what I did.

Written in Mode 2 (that's 16 colours, but 20K of the BBC B's 32K of Ram used up), *Galaforce* looks pretty. It's also very fast - really fast - and will have you gnashing your teeth as you get killed time and time again. Just one more time, you think to yourself; just one more time.

Vast numbers of colourful aliens swoop down on your ship, positioned at the bottom of the screen (although you can move around within the bottom third) and you must do your best to shoot them down with your finger firmly glued to the auto-repeat fire button. Even though they don't start firing back until Zone Four, some of the waves require split second timing and nerve (not to say a fair measure of luck) to complete.

Time after time you will say to yourself... "I will not be

beaten by a game this simple" ... and time and time again you get blasted into oblivion.

With some good sound (which can be turned off for those late night sessions) and some great simple reflex action, this will appeal to every arcade masochist, that ever existed.



C16/Plus 4

Program Karate King Type Arcade **Micro** C16/Plus 4 **Price** £6.95 **Supplier** Anco, 35 West Hill, Dartford, Kent DA1 2EL.

Program Jeep Command Type Arcade **Micro** C16/Plus 4 **Price** £2.99 **Supplier** Bug-Byte, Victory House, Leicester Place, London WC2.

Commodore 128

Program Thai Boxing Type Arcade **Micro** Commodore 128 **Price** £11.95 (disc only) **Supplier** Anco, 35 West Hill, Dartford, Kent DA1 2EL.

Commodore 64

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Program L'Affaire Vera Cruz Type Adventure **Micro** Commodore 64 **Price** £8.95 **Supplier** Infogrames, Mitre House, Abbey Road, Enfield, Middx EN1 2RQ.

Program Galax-i-Birds Type Arcade **Micro** Commodore 64 **Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1.

Program The Best of Beyond Type Compilation **Micro** Commodore 64 **Price** £9.95 **Supplier** Beyond, 64-67 New Oxford Street, London WC1.

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MSX

Program Jewels of Darkness Type Adventure **Micro** MSX **Price** £14.95 **Supplier** Rainbird Software, 74-76 New Oxford Street, London WC1.

Spectrum

Program Scuba Dive Type Arcade **Micro** Spectrum **Price** £2.99 **Supplier** Elite Systems, Anchor House, Anchor Road, Aldridge, Walsall WS9 8PW.

Program TT Racer Type Arcade **Micro** Spectrum **Price** £9.95 **Supplier** Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

Program Jewels of Darkness Type Adventure **Micro** Spectrum **Price** £14.95 **Supplier** Rainbird Software, 64-67 New Oxford Street, London WC1.

Program Icon Graphix 128 Type Utility **Micro** Spectrum 128 **Price** £12.95 **Supplier** Audiogenic, PO Box 88, Reading, Berkshire RG7 4AA.

Program Kai Temple Type Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1.

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Program Miami Dice Type Arcade **Micro** Spectrum **Price** £2.99 **Supplier** Bug-Byte, Victory House, Leicester Place, London WC2.

Program Gyrion Arena Type Arcade/Puzzle **Micro** Spectrum **Price** £1.99 **Supplier** Firebird Software, 64-67 New Oxford Street, London WC1A 1PS.

It almost makes me nostalgic to think that Gyrion was released almost two years ago now - the first of the Gold range from the Firebird stable. So why bring out a version of it now?

Well, Gyrion, an excellent 3D arcade/puzzle game, looks as impressive now as it did then - and all credit to the original authors for that - but what we have here is the version of the game that was presented to the finalists of the Gyrion competition - first prize being a Porsche or £12,500.



Thirty English contestants were gathered together (simultaneously with contestants in Denmark and Spain), and had to complete this Arena maze - together with those mysterious moving spheres and deadly towers - as fast as possible. The winner did in 18 minutes, so give your ego a chance and see if you can do better.

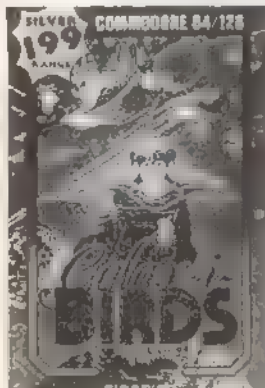
Exactly the same as the original in gameplay, at this price, it's worth getting even if you have the Mk 1 version (for the new challenge) and if you never bought it in the first place, then here's your chance to find out what all the fuss was about for £1.99. The winner? Oh - he was a Spanish guy - but there again, we didn't win the World Cup either, did we?

Program Nightmare Rally Type Arcade **Micro** Spectrum **Price** £7.95 **Supplier** Ocean Software, 6 Central Street, Manchester M2 5NS.

Nightmare Rally may sound like the average trip down the M6, but National Coaches were never like this. 3D scenery with a strict time limit, bumpy terrain, all the action of skidding and harsh last minute breaking together with trees that'll stop you dead if you crash into them. On the other hand - was anyone else on the 0637 from Chester to London last week?

Well, in any case, no videos aboard your supercharged buggy in Nightmare Rally, as you scream up through the gears, weaving through the slalom-type gates to finish the course.

Broadly based on a very successful arcade racing game, this is good fun, with a 3D display of the action on the top two thirds of the screen, and the various instruments (rev counter, speedo, etc) on the bottom third. The scrolling is fairly smooth and fast, the sound is certainly noisy and although far from being a driving simulator, if you are in the mood for a fun driving game in which you can somersault your vehicle and get away with it - grab it while it's going.



More substance, less show

In 1984, any new games released appeared to be judged by its resemblance to *Manic Miner/Jet Set Willy*. Last year, licensing deals kicked off the spring fashions (if it moved, it was licensed), then sports simulations took over in time for the PCW show. This year, it's the coin-ops.

And very nicely this trend is doing, too, with plenty of conversions of excellent arcade games on the way this autumn.

The PCW show is always the one that no-one wants to miss. In five days at Olympia you can see exactly what will be on the market this autumn and Christmas.

It also signifies the end of that home computing bogle, the "dead summer".

This summer, however, doesn't appear to have been so bad, something which is probably connected with the weather. The software and hardware companies pray for poor weather because it keeps their customers in doors and at their computers.

Last year's PCW show surprised many people with its record-breaking levels of attendance, and this year's looks to be just as successful if not more so. Even on the trade days, the show was packed to bursting point, and business frantic. Visitors and stand holders mopped brows in unison.

This year will probably be

remembered as the Year of the Stand. Trestle tables, coloured nylon sheets and handwritten "special show offer" posters had to take their places at the sides of the hall, as the construction companies moved into the centre to build on-site high-tech, high rise blocks from scratch. Elite, Melbourne House, Ocean and US Gold vied for the architectural design awards. Enough people have been to exhibitions in the States to decide to go the American way.

But the PCW show isn't really about three storey stands with en-suite bathrooms. It's about products that people can look at, get a hands-on test, and decide whether to buy when released. The glossy stands are just part of the marketing. *Revolution* from Vortex/US Gold would look just as good displayed on a wooden bench with a dust cover backdrop.

Heaven knows exhibitions are about the one place where the software customer can get a demonstration or play test before buying (any hardware customer who doesn't demand a full demonstration before buying needs their head examining). Video demos are beginning to reach the retailers, but have been a curiously long time in coming.

It's a shame therefore that quite a few companies were showing videos of the original, or the original coin-op

machine *instead* of the game — or some screens from the game if it wasn't ready for public consumption. I would have preferred it if the videos/arcade machines had been as well as a look at the game. Videos of the game itself or part thereof are an acceptable compromise, I suppose. Still, it's all better than nothing at all.

One company that is making a point of timing its product launches exactly right to capture the public's interest for the show is Amstrad. Last year, the CPC 6128 and PCW 8256 had been launched ten days previously and given heavy coverage in newspapers — and TV, if I remember rightly.

This year, the Amstrad PCs (subject of more anonymous sightings than Lucan) filled the same gap. On both occasions, the Amstrad stand has been congested in the extreme. This year, I don't think there was a single show visitor who didn't crane their neck to a glimpse of the much-fabled machines.

Last year, Amstrad's rival for crowds was Atari. This time, Atari dissociated itself from the riff-raff and cunningly relocated in the corridor. The corridor, that is, between the home and business sections of the show, nicely bridging the gap between the home and business market.

Christina Erskine

NEXT WEEK

Special supplement QL developments

The QL is not dead. CST's Thor and Q Jump QLT compared.

Plus Eye-Q, graphics from Digital Precision, and Giga Basic and Giga Desk.

Chess

Martyn Bryant with the second of our new monthly series on computers and chess.

All the latest news and events, plus a report on the progress of the *Popular* vs *Colossus* chess tournament.

Communications

All you ever wanted to know about radio communications but were afraid to ask. Phil Bridges has the details.

Games

The latest from Vortex, producer of such goodies as *Highway Encounter*. This one's called *Revolution*, and maintains the Vortex tradition.

And new from Quicksilver is *Glider Rider*, a 3D arcade adventure.

Hackers



HEARTLAND

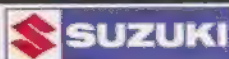


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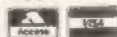
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